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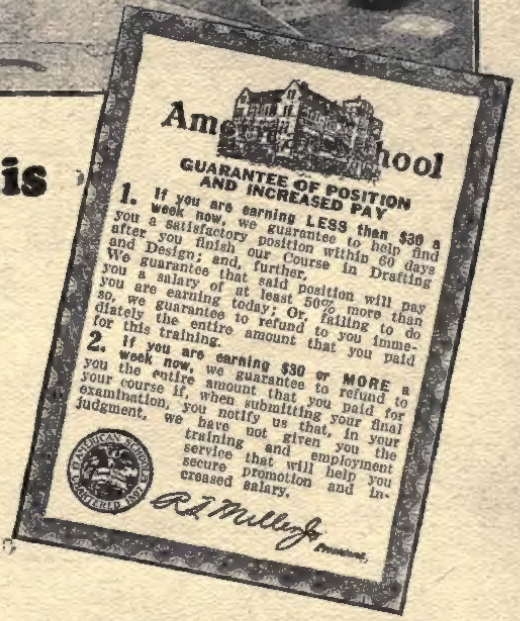
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JULES VERNE'S TOMBSTONE AT AMIENS PORTRAYING HIS IMMORTALITY

AMAZING STORIES

July, 1929
Vol. 4, No. 4

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Our Cover

this month depicts a scene in "The Desert of Ice," by Jules Verne, in which the Captain and his faithful friends and sturdy followers to the North Pole, finally succeed in blowing up the bears, who have come very near imprisoning the group in their igloo.

In Our Next Issue:

BARTON'S ISLAND, by Harl Vincent. In his previous story, "The Seventh Generation," Mr. Vincent just gave us an inkling of what he was capable of doing with a theme dealing with the future. He bases his ideas of the future on present political and scientific trends and draws a realistic picture of what may come.

OUT OF THE VOID, by Leslie F. Stone. A serial in two parts (Part 1). With such inventions as permalloy and the strides which are made in the field of aviation, we can look with less cynicism on the possibilities of interstellar flyers. The description of such a ship in this story is excellent and the trips and adventures had on this space-flyer are extremely fascinating.

THE ETERNAL PROFESSORS, by David H. Keller, M.D. Just because one member or one part of the body becomes incapacitated through disease, doesn't seem sufficient reason for the complete elimination of the entire body. Some things have been written on the subject before, but Dr. Keller, in his well-known manner, strikes the subject definitely and with much understanding.

THE DIMENSION SEGREGATOR, by J. Harold Click. Much has been written about the mysterious fourth dimension, but it remains more, rather than less, mysterious. This new author's idea about it is incontestably good. In order to learn about the 4th dimension, it is necessary to know more about the 2nd dimension. Logically it must be so. It is a good idea unusually well handled in every way.

THE WAND OF CREATION, by Stanton A. Coblentz. Synthetic life might some day become an established matter—so much experimenting is being done in that field now. How desirable successful experiments in this field would prove, is another matter. And an interesting version of one dangerous possibility is excellently written into this story.

THE GRIM INHERITANCE, by Carl Clausen. It is almost appalling when you consider the deleterious effect a minute defective ductless gland can have on the well-being and health of an individual. The endocrine gland is particularly interesting and the author of this story has aptly used it in a scientific detective story of definite merit. Crowded out of the July issue.

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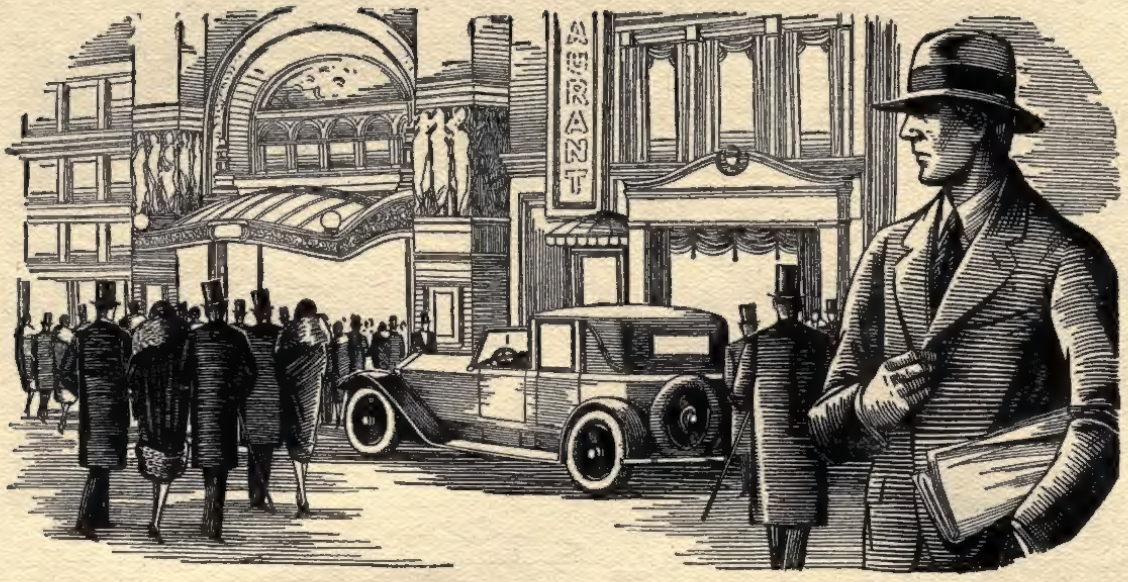

Always outside of things—that's where I was just twelve short months ago. I just didn't have the cash, that was all. No theatres, no parties, no good restaurants. No real enjoyment of life. I was just getting by, just existing. What a difference today! I drive my own car, have a good bank account, enjoy all the amusements I please.

I Couldn't Get the Good Things of Life

Then I Quit My Job and "Found" Myself!

HOW does a man go about making more money? If I asked myself that question once, I asked it a hundred times!

I know the answer now—you bet. I know the way good money is made, and I'm making it. Gone forever are the days of cheap shoes, cheap clothes, walking home to save carfare, pinching pennies to make my salary last from one pay-day to the next one. I own one of the finest Radio stores you ever saw, and I get almost all the Radio service and repair work in town. The other Radio dealers send their hard jobs to me, so you can see how I stand in my line.

But—it's just a year ago that I was a poorly-paid clerk. I was struggling along on a starvation salary until by accident my eyes were opened and I saw just what was the matter with me. Here's the story of just how it happened.

One of the big moments of my life had come. I had just popped the fatal question, and Louise said "Yes."

Louise wanted to go in and tell her father about it right away, so we did. He sort of grunted when we told him the news, and asked Louise to leave us alone. And my heart began to sink as I looked at his face.

"So you and Louise have decided to get married," he said to me when we were alone.

"Well, Bill, just listen to me. I've watched you often here at the house with Louise and I think you are a pretty good, upstanding young fellow. I knew your father and mother, and you've always had a good reputation here, too. But let me ask you just one question—how much money do you make?"

"Twenty-eight a week," I told him.

He didn't say a word—just wrote it down on a piece of paper.

"Have you any prospects of a better job or a good raise some time soon?" he asked.

"No, sir; I can't honestly say that I have," I admitted. "I'm looking for something better all the time, though."

"Looking, eh? How do you go about it?"

Well, that question stopped me.

How did I? I was willing to take a better job if I saw the chance all right, but I certainly had laid no plans to make such a job for myself. When he saw my confusion he grunted. "I thought so," he said, then he held up some figures he'd been scribbling at.

"I've just been figuring out your family budget, Bill, for a salary of twenty-eight a week. I've figured it several ways, so you can take your pick of the one you like best. Here's Budget No. 1: I figure you can afford a very small unfurnished apartment, make your payments on enough plain, inexpensive furniture to fix such an apartment up, pay your electricity, gas and water bills, buy just about one modest outfit of clothes for both of you once a year, and save three dollars a week for sickness, insurance, and emergencies. But you can't eat. And you'll have to go without amusements until you can get a good substantial raise in salary."

I began to turn red as fire.

"That budget isn't so good after all," he said, glancing at me; "maybe Budget No. 2 will sound better——"

"That's enough, Mr. Sullivan," I said. "Have a heart. I can see things pretty clearly now; things I was kidding myself about before. Let me go home and think this over." And home I went, my mind in a whirl.

At home I turned the problem over and over in my mind. I'd popped the question at Louise on impulse, without thinking it out. Everything Mr. Sullivan had said was gospel truth. I couldn't see anything to do, any way to turn. But I had to have more money.

I began to thumb the pages of a magazine which lay on the table beside me. Suddenly an advertisement seemed almost to leap out at my eyes, an advertisement telling of big opportunities for trained men to succeed in the great new Radio field. With the advertisement was a coupon offering a big free book full of information. I sent the coupon in, and in a few days received a handsome 64-page book, printed in two colors, telling all about the opportunities in the Radio field and how a man can prepare quickly and easily at home to take advantage of these opportunities. I read the book carefully, and when I finished it I made my decision.

What's happened in the twelve months since that day seems almost like a dream to me now. For ten of those twelve months I've had a Radio business of my own! At first, of course, I started it as a little proposition on the side, under the guidance of the National Radio Institute, the institution that gave me my Radio training. It wasn't long before I was getting so much to do in the Radio line that I quit my measly little clerical job, and devoted my full time to my Radio business.

Since that time I've gone right on up, always under the watchful guidance of my friends at the National Radio Institute. They would have given me just as much help, too, if I had wanted to follow some other line of Radio besides building my own retail business, such as broadcasting, manufacturing, experimenting, sea operating, or any one of the score of lines they prepare you for. And to think that until that day I sent for their eye-opening book, I'd been wailing "I never had a chance!"

Now I'm making real money. Louise and I have been married six months, and there wasn't any kidding about budgets by Mr. Sullivan when we stepped off, either. I'll bet that today I make more money than the old boy himself.

Here's a real tip. You may not be as bad off as I was. But, think it over—are you satisfied? Are you making enough money, at work that you like? Would you sign a contract to stay where you are now for the next ten years, making the same money? If not, you'd better be doing something about it instead of drifting.

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Take another tip—no matter what your plans are, no matter how much or how little you know about Radio—clip the coupon below and look their free book over. It is filled with interesting facts, figures, and photos, and the information it will give you is worth a few minutes of anybody's time. You will place yourself under no obligation—the book is free, and is gladly sent to anyone who wants to know about Radio. Just address J. E. Smith, President, National Radio Institute, Dept. 9-TT, Washington, D. C.

J. E. SMITH, President,
National Radio Institute,
Dept. 9-TT, Washington, D. C.

Dear Mr. Smith:

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"Smith stepped into the room. For the first time in his life he was face to face with Jerome Cardan.

"'Expected you several years sooner,' said Cardan. 'Sit down.'

"'I will try to be quicker in the killing business,' returned Smith. 'In the meantime, what do you think of Blavatsky's "Secret Doctrine"?'

"'It is the only complete book of real knowledge in the English language,' came the emphatic answer.

"'You are almost as fantastic as your namesake, Jerome Cardan, the Italian savant who died in Rome in 1576,' remarked Smith, lazily rolling another cigarette.

"Cardan spoke as if he were addressing a child. 'I am the Italian savant who died in Rome in 1576,' he stated. 'It was because my treatise "De Subtilitate" was so little understood that I ceased to be a follower of Vishnu and entered the service of Siva.'"

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VOLUME 4

AMAZING STORIES

THE MAGAZINE OF SCIENTIFICTION

JULY, 1929 No. 4

ARTHUR H. LYNCH, *Editorial Director*

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Editorial and General Offices: 381 Fourth Avenue, New York, N. Y.

Extravagant Fiction Today - - - - - - - - - Cold Fact To-morrow

Appreciation of the Common

By T. O'CONOR SLOANE, Ph.D.

THE essence of life is in appreciation and appreciation applies to all that is going on about us. It should take the form almost of astonishment. A locomotive engine, dragging its great train of Pullmans across the country, sends a thrill through the observer, if he is in any degree appreciative, although he may know that it is bad engineering from the standpoint of efficiency. The acceleration of a heavy electric train, which in a few seconds goes from rest up to forty or fifty miles an hour, is seen every day in the subway by crowds of people, who are very much more anxious to get home or to their offices, than they are to notice this wonderful exhibition of power. The writer once excited emotion, perhaps unpleasantly, in an acquaintance, by saying that he was astonished every time he crossed the river in a ferry-boat. But to one who has sailed on the same river in a twenty-foot catboat, and has struggled against a head-sea, close-hauled, the ferry-boat majestically driving through everything as if waves were unknown and heavy seas were null, is a wonder. The way the boat is built; the steel plates with what may be termed hermetic joints held together by rivets heated up nearly white-hot, and headed while hot so that their shrinkage operates to tighten the joints, the steel frame, its members bent accurately into shape, stiffening the hull, and the perfectly working, thought uneconomical steam-engine driving the screws, one at the bow and one at the stern, its width four times or more the length of the little sail-boat; if this is rightly considered, it is a miracle of engineering. It is none the less a miracle, because something better is imminent—namely, the internal combustion engine.

It is the very idea of amazement, which appears as the basis of a play which has excited some interest in the literary and theatrical circles. The hero in this play adopts electricity and the dynamo as his gods, and in the end is killed by the very dynamo which he almost worships. The same idea, incidentally, was used by H. G. Wells in his story, "Lord of the Dynamos," which appeared in a recent issue of AMAZING STORIES.

This brings us once more to the appropriateness of the name of the magazine. Viewed from this standpoint, AMAZING STORIES seems singularly well named. The stories in it give the development of the past and present of science and its possible future development. In many cases stories of this type might rank as impossibilities. But what has been done in the last fifteen years in the way of scientific progress teaches us to be very slow to pronounce an unachieved advance in science or an excursion into the distant future, to be an embodiment of impossibilities.

Imagination plays a large part in scientific investigation and discovery. Astonishment waits upon the announcement of great scientific work, inventions and discoveries. Familiarity with the great things that have been done, in the properly organized scientific mind, breeds no contempt. The ferry-boat in the Golden Gate of San Francisco or on the Hudson River of New York, embodies in its construction and action wonders enough to supply material for an epic poem. The locomotive with several hundreds pounds pressure on every square inch of its boiler surface, and delivering a great part of this pressure into the cylinders back of the pistons, with its train of cars undre perfect control by its airbrakes, is a wonderful object and of a type which never ceases to be wonderful.

And so we go down the line and find wonders everywhere. At one end the enormous mechanical and electrical developments, and at the other end the work done by almost infinitesimal electricity in the telephone and radio, and from the standpoint of efficiency, we have the marvelous animal system, doing so much work on so few calories—one who ceases to admire and to be thrilled with all this, is losing the best source of astonishment.

Men in perfect physical condition can do their work on a very small ration of food. Imagine feeding a boiler with what animals devour. What poor fuel it would be. Yet it is perfectly adequate for animal life. Eight men are taken as approximately representing a horse-power. What would a steam engineer think if you gave him the food consumed by these men in a day, and told him to develop one horse-power in a steam engine for a day with such fuel?

If we seek for economy in lighting, we must go to the fireflies of these latitudes, which are really little beetles, or to the larger Cucujos of South America. Investigators for years have been endeavoring to duplicate what these insects do, striving to find cold light, but so far without the slightest practical success. The animal system tells us what we should aim at doing, but no one knows how to do it.

We must let no good authors' conception of the future be too astonishing to be accepted, at least as possibilities, we must not hesitate to appreciate the poetry of science, and its romance. Authors should be given a free rein in using their imaginations. If they fire the souls of their readers, some of these may be led to do great work in the scientific and engineering field.

The BOOK of WORLDS

By Dr. Miles J. Breuer

Author of: "Buried Treasure," "The Stone Cat," etc.

TO psychiatrists, Professor Cosgrave's case is a striking study in the compensatory psychosis. He perches on the edge of his bed in a private sanitarium for mental diseases, and coos and twitters and waves a wreath of twigs in his lips. Whether he will ever recover his sanity or not is problematical. Whether anyone else will ever be able to understand and use his hyper-stereoscope is also problematical. And whether, if it were figured out, anyone would ever have the courage to use it, in the face of what happened to Professor Cosgrave, is still further remote in the realms of doubt and conjecture.

I have repeated the story for medical men so many times, that I am beginning to see a sort of logical sequence in things that at first utterly bewildered me. As Professor Cosgrave's chief assistant, I was undoubtedly closer to him and knew more about his work and about the mechanism of his tragic fate, than anyone else. The physicists who merely went over his apparatus and equations and did not know the man, did not grasp the significance of what happened, as did I, who lived and worked with him every day and many a night.

Yes, the thing begins to look logical to me now, after it has been on my mind constantly for several months. As no one else has been able to understand exactly what happened, I ought to do my best to render a consecutive account of events.

PROFESSOR HEMINGFORD COSGRAVE was the most highly civilized man I have ever known. If mankind is in truth becoming more civilized as time goes on, then it is following in the footsteps of such advanced and refined examples of human progress as was my late superior in the School of Physics. He was a small, delicate-looking man, with classical Greek features; with very little physical strength but with infinite physical endurance. To spend day and night in his laboratory for a week on end seemed to produce no deleterious effects upon him.

When I extol the rare combination of mathematical genius and experimental ability of this man, so well known, I am wasting my breath. But the world does not know so much about his other exquisitely subtle mental sensibilities. He was a poet and an artist; he saw all the beauty in Cosmos with a wondering eye. And he was as gently sympathetic as a woman. The reports of famine victims suffering in China disturbed him at his experiments. His student-assistants would conspire to guard him against the visits of the old Salvation Army Captain, who more than once lured him away from his desk, with the tale of some woman or child in distress. He was the last man in the world to be permitted to witness the horrors, that he said he saw.

A little over two years ago, he and I were planning together a demonstration for his class in Quadrics. We had considered making models of some of the solids, with whose equations the class was working; but the time and labor involved in this was almost out of question under the circumstances. I suggested that the Mathematics Department of the University of Chicago had all of these models already made. We solved the problem by my going to Chicago and photographing these models with a stereoscopic camera. The prints of the strangely shaped solids, viewed in a stereoscope, were quite as satisfactory for class purposes as would have been the models.

I had brought the pile of cards to Professor Cosgrave for approval. He had run through three or four of them, and seemed quite pleased. Suddenly he laid them down and stared at me.

"Do you know what just struck me?" he asked in a queer tone.

I shook my head.

"You know what I'm working on?" he asked.

"You mean your Expansion Equations—?"

"Popularly called the Fourth Dimension." He smiled at the thought. "And you know what I've begun to suspect about it, especially since the experiment with the gyroscope?"

"Yes, I do—though it's hard for me to grasp that there really might be another dimension. I've always considered the fourth dimension a mathematical abstraction."

"No abstraction."

He said it as one might say, two and two make four.

"Really something here. Do you see the connection now?" He shook the stereoscope at me.

I shook my head. I felt helpless. His mind was always far ahead of mine. He explained:

"This instrument takes a two-dimensional figure on a flat plane and builds it up so that the brain sees it as a three-dimensional solid in space!"

HE waited for me to grasp his idea, which I still failed to do. He smiled indulgently.

"*If* the fourth dimension is really a dimension and

"THE APPENDIX AND THE SPECTACLES" and "The Captured Cross-Section," both by Dr. Breuer, brought in a considerable amount of comment. This is the third story in that series. Although it can easily stand on its own merit, this series assumes added interest when we read Dr. Breuer's reason for writing these stories. We quote him: " . . . which I wrote largely because I didn't like Mr. Olsen's treatment of the subject of the fourth dimension." This ought to furnish plenty of new material for the "Discussions" columns, unless we miss our guess.

On the following day I had no classes, and I hurried to his laboratory. He was already there, spinning dials feverishly, and then bending over the leases. He had an unusual, nervous air about him. "Destructive rays!" he said, as I came in. "Deadly gases. Diabolical inventiveness."

not a mathematical abstraction—" he smiled confidentially as he emphasized the *if;* "can we not build a hyper-stereoscopic instrument which will build up a three-dimensional model of a fourth-dimensional object into an image perceptible to the brain in its true four-dimensional form?'

I continued to stare blankly from him to the stereoscope and back again.

"As a matter of fact," he continued; "our three-dimensional world is merely a *cross-section* cut by what we know as *space* out of the Cosmos that exists in four or more dimensions. Our three-dimensional world bears the same relation to the true status of affairs as do these flat photographs to the models that you photographed. Surely you can grasp that from our equations?"

"Yes," I assented eagerly, glad to find familiar ground to rest my feet on; "just as the present time is a cross-section of infinity cut by a moving space-sector whose motion is irreversible; it moves in one direction only."

He beamed at me for that. Then in silence he finished looking over the geometrical stereograms and handed them to me.

He spent six months working out his idea on paper. He did not discuss his plans with me very much; but he did give me sections of the problems to work out. For instance, he asked me to work out the equations for the projection of a tesseracoid:

$$c_1w^4 + c_2x^4 + c_3y^4 + c_4z^4 = k^4$$

from eight different directions, each opposing pair of right angles to the other three pairs. Most of the problems he gave me were projection problems; but beyond that I could not grasp the drift of his work.

Then he spent a year in experimental work. As I am a mathematician and not a laboratory man, I had less to do with the actual construction of the hyperstereoscope. But even there I helped. I worked at the refractive indices of crystals that he made in an electric furnace; and I worked out the mathematics of a very ingenious instrument for integrating light rays from two directions into one composite beam.

Apparently the thing was a complex job. Professor Cosgrave spent three weeks in the research laboratory of the Mechanical Engineering Department. He went to Chicago and remained there for a couple of months, leaving as his address the Psychology Department of the Chicago University. One day he announced to me calmly that the hyperstereoscope was finished.

"May I look?" I asked eagerly, expecting to be able to see out into the fourth dimension.

The instrument was pointed out of the window at the campus. It had three telescopes arranged in the form of a triangular parallelepiped. One end of the room was full of apparatus, electron tubes and photo-electric cells, a scanning disk, and tangles of wire strung between boxes and cabinets faced with dials and meters. At a small table there were two oculars to look into. I put my eyes to them.

It made me dizzy. It looked like rolling vapors—dense, heavy vapors, and boiling clouds, rolling and turmoiling swiftly and dizzily. It looked vibrant with heat. Through a rift here and there I got glimpses of a glowing liquid, like the white-hot metal in a foundry coming from the ladle. There were boiling, bubbling lakes of it. I shrank away from the instrument.

"What is it?" I gasped.

"I'm not sure," returned Professor Cosgrave. "Prolonged observation and correlation of observed data will be necessary before we can explain what we see."

He was whirling dials rapidly. I looked again. There were vapors, but they were thin spirals and wisps. Mostly there were bare, smoking rocks. There was a bleak, insufferably dreary stretch of them, extending on into the infinite distance. It looked hot. It was infinitely depressing. I didn't like it.

I STOOD for a long time behind Professor Cosgrave, as he sat at one little table with his eyes to the oculars of the instrument and twiddled the dials. I was about to turn around and slip out of the room and leave him to play with it alone, when he sat up suddenly. A new idea had struck him.

"Beyond a doubt these places that we see are regions of some sort, not in our 'space' at all, or else infinitely far away. But, in the direction of the fourth dimension they are quite near us. Just as if you are in a window on the top story of a skyscraper office building and a dozen feet away is a man in the window of an adjacent building. To your three-dimensional vision he is quite near you. But to your body, whose motion is confined to two-dimensional surfaces, your friend is a long distance away. To your touch, instead of a dozen feet away he is a quarter of a mile away; that is how far you have to travel before you can reach him.

"Or, if I make a mark at each end of this sheet of paper and then bend the sheet double, from a three-dimensional standpoint the marks are a millimeter apart. But from a two-dimensional standpoint they are thirty centimeters apart.

"This stereoscope *sees across,* in the same way, to some other universe."

He shook his head.

"My analogies are poor. It is a difficult idea to express. But look!"

I went to the eye-pieces. There was water. It was endless. Just water. It swelled and rolled and pulsated. A swing of the telescopes over at the window brought into view some black rocks. Over the rocks was slime. A slime that flowed and rounded itself into worm-like forms. It was hideous. I left the gloating Professor Cosgrave and hurried away.

After that, as my recollection serves, things moved rapidly. I saw him a couple of days later at his stereoscope.

"I have it!" he said elatedly when he saw me. I hastened to look into the instrument.

"No!" he exclaimed, pulling me away. "I mean an analogy. Like points on the leaves of a book. You see?"

I nodded. He continued.

"Points on the adjacent leaves of a book are far apart, considered two-dimensionally. But, with the book closed, and to a three-dimensional perception which can *see across* from one page to another, the two points are very near together. You see?"

I nodded again.

"Now look!"

I saw a dense swamp, among huge trees with broad, rich green leaves. Gigantic saurians stalked about and splashed hugely.

"It is like a story of evolution," I couldn't help remarking.

He nodded in satisfaction and mused on:

"Each of these must be a separate and distinct world. I can go back and forth among them at will. It is not a continuous story. There are steps. Definite jumps. Nothing between. I can see any one of them at any time. Like the leaves of a book!"

I looked again. The professor had not touched the setting and the scene was exactly the same. A huge saurian was devouring some living creature from the water. The water was threshed into a pink foam, and light-red blood was splashed over the green foliage. The professor was talking:

"What we see is worlds or universes arranged side by side in the fourth dimension. Like leaves in a book.

"Heavens! What an encyclopedia!"

"I see," I said slowly, not sure that I really did. "Like serial sections cut in a microtome."

"Comparable. But not really sections. Separate worlds. Three-dimensional worlds like our own. Side by side, each of them one page ahead of the preceding. Three-dimensional leaves in a four-dimensional book."

It was a little difficult to grasp. I thought a while.

"I'd like to have Carver of Purdue see this," I said. "Do you remember his article in the *Scientific Monthly* about your four-space equations? It was almost personal. Ill-becoming to a scientific man. I'd give my shirt to see his face when he sees this. Let's bring him down."

Professor Cosgrave shook his head.

"What object can there be in causing the man any unpleasant feeling? The world holds enough unpleasant situations without our multiplying them. I shall break the news to him pleasantly when the opportunity presents itself."

That was typical of Professor Cosgrave. That is just how considerate and sympathetic he always was. Always he was trying to spare other people unpleasantness or discomfort. The man was wasted on our present-day selfish and discourteous age. He ought to have been born into some future Utopia.

WHAT would he do now? I wondered. There was obviously a vast number of worlds to observe. It would take a lifetime to have a good look at each one of them. Would he spend his time on satisfying his curiosity and turn his back on mathematical physics? He still had numerous important problems ahead of him in the latter field. He was barely started on his career as a mathematical physicist, yet the world was expecting great things of him.

However, for the present there was apparently one phase of the purely observational pursuit for him.

"The 'leaves' in this book seem to be arranged in absolutely orderly succession," he said. "By chance I began at the end where the evolutionary development was lowest. By swinging my visual field through the unknown dimension in one direction, I can see the worlds in succession, each a little further evolved than the preceding. Now, I'm a physicist, and cannot afford to waste much time in gratifying idle curiosity. But, I must spend a few days or weeks in following out this evolutionary series before I turn it over to some biologist. This is too much of a temptation for any kind of a scientific man."

For several days I would come into the room and see him there with his eyes glued to the oculars, too absorbed even to notice my entrance. His attitude was one of tense and motionless concentration. I would steal out again, loth to disturb him. Once I came in and noted that he was trembling violently all over as he gazed into the machine. A couple of days later I found him in the same position, as though he had not moved since I had been there last. His whole body was set and rigid. I was alarmed at the way he looked. I stepped closer; his jaw was set and his breathing was shallow.

I felt concerned about him, and I made a sound to attract his attention. He started suddenly and leaped to his feet, and turned to me a face that was white with horror.

"I've been a student!" he gasped. "A scientific man. I never stopped to realize that men were like that." He sank into a chair, his hands on his knees, his head drooped.

I looked into the stereoscope. This time there were men. An army stood drawn up, with shining helmets and fluttering pennants, extending far into the dim distance. The foreground was red and active; everything was splattered with blood; men were swinging swords. There were rows of captives and men cutting their heads off. I watched only a second before I recoiled, but saw a dozen heads roll on the ground and fountains of blood gush over victims and executioners alike.

"You have no business looking at that!" I exclaimed.

It was incongruous. This delicately organized, unselfish, tender-hearted man to be spending his days gazing at those things.

"It's been that way from the beginning," he whispered, shuddering. "Ever since rudimentary humans appeared in the series . . . war, brutality, cruelty, wanton killing of people . . ."

But I couldn't keep him away from the thing. He called me to it and explained:

"As far as I can understand this, I am swinging the field of view through an arc in a dimension that extends at right angles to the three known dimensions. At intervals I see a world. In between there is nothing. The swing is accomplished by changing the intensity of the electrical field through crystals of this zirconium compound, which alters their refractivity.

"I am going steadily down my scale toward zero.

The worlds are getting further and further advanced in the scale of evolution. I can see it clearly now."

In a moment he was back at the instrument, completely absorbed, and oblivious of me. I was worried about him. I came in daily to watch him, and many a time I came and went without his having been conscious of my presence. There was something wrong about the thing; the intense absorption of a man of his sympathetic type in scenes of inhumanity such as I had seen. One day when I opened the door, he was facing it, waiting for me.

"I am nearly at zero. Look! A world much like ours."

In the lenses I saw the buildings of a city, rather odd, but for all the world suggesting London or Paris; swarming crowds of people, hurrying vehicles. It was quite like our world, but just enough different so that I was sure it was not our world.

Professor Cosgrave was pale and agitated.

"MAN'S inhumanity to man!" he moaned. "It would drive me distracted, were there not one hope. Just now, in that fair city, I watched a mob drag men and women through the streets and stick their bodies up on poles on a bridge; and blood dripped into the river.

"But, step by step, there is more intellect, more material progress. There is hope that man will eventually develop intelligence enough to stop his senseless and cruel fighting, and learn cooperation and altruism. Each of these worlds seems to bring us a little nearer to that."

He called my attention as he turned his dials to zero, and looked into the instrument. He turned to me with a queer smile.

"Look!"

I applied my eye again. There was the campus and athletic field, the gravel drives and the men's dormitory. Through the stereoscope or through the window, I got the same view.

"At zero we see our own 'plane' of the unknown dimension. *Our* page in the book. You see?"

"Now what?" I asked.

"Now negative potential values. Now to see the pages ahead of us in the book. Worlds further evolved than ours. The future! Up to the limits of the inductance of my coils!"

His eyes glowed and his breath came fast.

"The future!" he whispered as he bent over the oculars and carefully turned his dials. "In the future lies man's hope. In intelligence and science!"

Again he sat in motionless absorption. Occasionally he touched a dial or whispered to himself. Finally, as he said not a word for a half an hour, I tiptoed out.

The next day I found him staringly expecting my arrival with wide-open eyes, like a man with exophthalmic goiter.

"I don't know what makes me go on with this!" he gasped. "Men are beasts. Hopeless. They never will be anything else. Twenty airplanes went over a city dropping bombs. Swept it away. It is burning now. In one place I saw through the smoke a small child hemmed in a courtyard by flames. A city as grand as Chicago. A sea of smoke and flame." He sat with his head bowed in his hands.

I didn't know what to say. He seemed utterly crushed; I could not rouse him. Finally I led him out of the room, got him in my car, and took him home. I pondered on how I might get him away from that machine for a while.

But the next day he was back again at the machine. I had classes until four o'clock that afternoon. Then I hurried into the laboratory. I found a changed man.

He was stern and determined. This rather relieved me; for I had been worried about his hopeless depression, and I did not realize what was taking place in the man. It seemed to me then that he had shaken off the depression and had determined to do something about the situation of war and humanity.

"Here is a world thousands of years ahead of ours," he related. "Humanity crowds it densely beyond our conception. Thank God, it is another world somewhere else, and not ours. People have not risen an inch from bestiality in millenia. No—stay away from it; I can't permit you to witness such horrors. Men and women soldiers piled up in mangled, bloody heaps as high as the Capitol Building. Each belch of that machine kills a thousand more—stay away!

"It is not our world. We can still save our world from that. We start today, Harlan, you and I, to prevent such things from happening in our world."

"We've got to stop it!" he said again. But he sat and stared into the instrument.

I was puzzled and not a little alarmed. The sudden, stern determination of the gentle little man fitted him most strangely. I would have thought him play-acting for my benefit, had he not looked most terribly grim. Anyway, I was relieved to see that terrible depression had left him, and that he had got hold of himself. That is what I thought then.

He permitted me to lead him out again, and I took him home. He kept saying with grim determination:

"Not to *our* human race; We *won't* let it happen!"

On the following day I had no classes, and I called for him at him home early in the morning. He had already left. I hurried to his laboratory. He was already there, spinning dials feverishly, and then bending over the lenses. He had an unusual, nervous air about him.

"Destructive rays!" he said to me as I came in, but without looking away from the oculars. "Wither up a thousand people like snowflakes in a chimney-blast. Terrific explosives. Deadly gases. Bombs filled with disease germs. Diabolical inventiveness."

He whirled around and faced me.

"Everything indicates that our world is part of this scheme. It is going the same way. It will be what this is. We must stop it."

HE stood up in the middle of the room and talked, and I took the opportunity to peer into the lenses. I saw a dead world. Wreckage. Ashes. Explosion holes. Disintegrating bodies. Nowhere a movement.

Even vegetable life had withered. There was a pile of bombs ready to fire beside a huge gun and a gunner lay dead beside them.

There was a queer declamatory quality to the speech that Professor Cosgrave was making. He said queer, silly things about Universal Peace. And yet I didn't suspect.

Only the next morning when I came in, it dawned on me. He was perched on a tall stool, with a wreath of twigs in his lips. As I came in, he put the wreath around his neck, and sang in a high key:

"I am the Dove of Peace.
Listen to me: All men are brothers.
There shall be no more war.
I shall spread my wings over the world.
I am the Dove of Peace."

Tears sprang to my eyes as the truth suddenly dawned upon me. I gulped as I hurried to another room to telephone. Poor Professor Cosgrave!

Then, as they led him out, I looked into the lenses. There was a rugged stretch, smooth, gently undulating holes and hummocks as far as the eye could reach, covered with a slimy, disgusting fungus growth. Here and there the fungus covered a ragged shape suggesting the ruined wall of a building. There was no change in this scene during the four days before the machine's batteries ran down (for I did not know how to shut it off). Now, no one knows how to operate it.

Professor Cosgrave knows me. He is always glad to see me at at his room at the sanitarium. But he talks to me only about Universal Brotherhood and about my duty to save mankind from strife and bloodshed. And he flaps his arms like wings and coos.

THE END.

After 12,000 Years

By Stanton A. Coblentz

WHAT will our world be like 12,000 years from now? Judging by the strides that we are now making in the fields of science and mechanics, it is well nigh impossible to foretell what the world will be like even 1200 years hence. The standardising of life which seems to be going on apace now—for business efficiency and military prowess—would seem to indicate an age of the highest sort of specialized development. Should we examine more closely the idea of specialization in various fields of endeavor, we might discern a striking similarity between our organization and—according to eminent authorities on the subject—the highly organized development of the ants, for instance. Do we not seem to be working toward an extremely specialized organization?

Mr. Coblentz, author of "The Sunken World," seems to have a genius for showing us up to ourselves, in a most casual and incidental manner. You sometimes wonder whether he is conscious of poking fun at us, all the time quietly laughing to himself, or whether he is drawing a true picture, showing us shorn of all trimmings, such as rationalizations and our high-sounding ideals, without himself realizing that he is doing it.

If we were suddenly projected into the year 13,929, what should we be likely to find? It is always interesting to allow our imaginations to roam into the distant future. Our well-known author allows his imagination free rein, though he adheres pretty strictly to scientific facts, and builds on modern tendencies. He gives us his ideas in a realistic and subtly satirical manner, which makes this story even more absorbingly interesting than "The Sunken World."

This story is published in the Spring Edition of AMAZING STORIES QUARTERLY

Now on sale at all newsstands

Locked Worlds

By Edmond Hamilton

THIS time our author, who is no longer a stranger to AMAZING STORIES readers, presents a most unique and original story. It fairly bristles with the fourth dimension, foreign worlds, adventure and excitement throughout.

As an experiment in evolution, Mr. Hamilton presents us with a number of original ideas which are not so preposterous as they may seem at first blush. Humanity, during untold thousands of years, has domesticated a great many animals, from the horse down to the cat, all of whom at one time were wild and more or less ferocious. Even insects have been trained to perform amazing feats, so the author's ideas will not appear quite so far-fetched in the light of what has happened before in human progress.

We know you will enjoy this story, and we know it will cause endless discussion and comment from our readers, as was the case with the author's other story, "The Comet Doom." We look forward with much interest to our readers' reaction to "Locked Worlds."

This story is published in the Spring Edition of AMAZING STORIES QUARTERLY

Now on sale at all newsstands

The SUPERPERFECT BRIDE

By Bob Olsen

Author of: "Four Dimensional Robberies," "Four Dimensional Surgery," etc.

ONLY a few years ago, even when the famous Fannie Brice acquired a Roman (or was it Greek) nose, some people laughed and poked fun at the idea, and there were a goodly number of people who thought it was unbelievable and impossible. Yet, today plastic surgery is an established art and has made remarkable strides. The science of grafting parts of the body has also reached a definite status. It does not require a wild imagination, therefore, to picture the possibilities which would result from greater perfection of each or a combination of both. Much might be done in the near future. We think the author's ideas on the subject are decidedly provocative of argument—both for and against. And even if you don't want to argue "The Superperfect Bride" furnishes a surprise ending that alone makes the story worth reading.

"HOW would you like to marry a woman who is absolutely perfect in face and form?" asked Doctor Goddard.

"Is there such a woman?" Broderick doubted.

"Judge for yourself." He pressed a button; and, as if operated by the invisible hands of spirits, the green curtains at the end of the room parted and swayed open.

Astounded beyond measure by the unexpected sight which met his eyes, Broderick sat for a moment of pulseless rapture; then, a sudden throbbing of arteries, he leaned forward, his eyes bound as if by invisible wires to the female form which the open curtain had disclosed.

She was nude, and yet not naked, since the heavy profusion of lustrous yellow hair, which fell to her knees, clothed her in a garment more modest than a bathing suit.

Held as if by some mesmeric power, Broderick remained seated until the curtains mysteriously and silently fell together. Then he rose to his feet, and, with the steps of a somnambulist, faltered toward Goddard.

"Open the curtains again, please! I didn't have time —Oh, please let me see her again. Won't you let me push the button myself?"

"Go ahead, but don't blame me for what happens."

At Broderick's touch the green curtains again swayed open. A cry of disappointment escaped from his lips —the alcove beyond was empty.

"Be patient, importunate youth," Goddard interposed. "You shall see her again in half an hour. Perhaps you may even be permitted to kiss her hand. Only give her time to dress. And now about the answer to your question? Do you think there is such a thing as a perfect woman?"

"Perfect? She is superperfect! I've never seen anything in sculpture or painting to compare with her. It is impossible to believe that such a lovely creature could have been born. She must have been created, full-grown, by a God who models with flesh."

"You are right," said Goddard. "She was not born, but created; and I am her creator."

"You her creator? What do you mean?"

"Just what I said. I made her what she is. Shall I tell you how I did it? It may be some time before Eve is ready."

"Yes, yes, tell me, I beg of you."

"As you perspicuously remarked a moment ago, it is impossible for a perfect being to be born. Nature produces many handsome things but none of them are absolutely flawless. Go into the garden, and select the prettiest blossom you can find. A careful examination convinces you that it is absolutely perfect, but scrutinize it through the penetrating lens of a microscope, and you discover countless blemishes, and irregularities of outline, which would bar it completely from the realm of artistic perfection.

"As with the tiny flower, so with the big things in the world of beauty. Gaze upon a wonderful landscape, so stupendous, so enchanting that, to the casual observer, it seems the utter climax of perfection, but the discerning eyes of the trained aesthete would find it lacking in unity, balance and harmony. As a scene it may be beautiful; but as a picture it is full of faults of composition, exaggeration in coloring, incongruities of structure and over-vividness of detail.

"No artist dares to paint a landscape exactly as he sees it. His mission is to select, to modify, to recombine, and thus, from the parts which nature offers him, to construct a complete, unified, beautiful whole.

"Poe brings out this idea in his story called 'The Domain of Arnheim.' You've read it? No? Well, you ought to. It's a masterpiece of descriptive diction. It tells about a man with the soul of an artist and a poet, the fortune of a Croesus, and a fervid passion for happiness. He employed a portion of his great wealth in constructing a garden, in which every individual nook and vista offered to the eyes of the observer a beautiful and artistically perfect picture. This he accomplished through an exalted form of landscape gardening, using all the individual units just as they occurred in nature, but eliminating recombining, rearranging and supplementing according to the absolute laws of art.

"The wealthy landscape gardener regarded this as the realization of the highest ideal of beauty. I do not agree. To my mind, aesthetic perfection can only be attained by a single unified object, which is small enough to be taken in with a solitary glance, and yet rich in infinite details of form and coloring, so that the eye,

Doctor Goddard anticipated Broderick's decision almost to the minute. He had everything in readiness for the first operation.

while keeping the lovely whole ever focussed on the retina, is constantly discovering new elements of beauty to admire. Of all individual objects in the universe there is none so capable of variation of beauty and ugliness as the human body, especially the body of a woman.

"FOR centuries, sculptors and artists have striven to delineate human forms of consummate beauty, yet none has fully succeeded. The nearest approaches to perfection have been achieved by those who used composite models, combining the face of one with the torso of another and the limbs of a third.

"Even with this method, the results produced have been far from faultless. Witness, for instance, the learned criticism of the classic example of feminine grace, the statue of the Venus de' Medici. Edwin Chadwick, a noted scientist and connoisseur, says that the Venus de' Medici is lacking in two most important attributes of human beauty—health and mentality. Her chest is too narrow, indicating insufficient development of the lungs; her limbs are without evidence of due training of the muscles; and her cranium and face are deficient in all traits of intellect.

"Were it possible for the sculptor to produce a flawless model of a woman's figure, he is still woefully handicapped since he can only represent form, without color or any other attribute of the living being. The painter has the advantage of being able to impart the hues of nature. By skilful shading he also gives his flat canvas a third dimension, suggesting solidness, and elegance of contour.

"But neither the painting nor the statue can depict one of the most important attributes of living beauty, namely motion. To be perfectly beautiful, a creation must have the breath of life, and the power of locomotion. Bryon was right when he said:

"I've seen more living beauty, ripe and real
Than all the nonsense of their stone ideal."

"He forgot, though, the fact, of which you seem cognizant, that it is impossible for blind nature to produce anything which possesses complete and faultless pulchritude. Unlike a poet, the perfect Venus must be made, not born.

"It is to the creation of this lofty ideal of a living, moving, intelligent woman, absolutely lovely in body and mind, that I have dedicated my lifetime of artistic and scientific research and my entire fortune. You have just seen in Eve the realization of this great ambition."

He paused a moment to observe the effect of his discourse on his young listener. Broderick had followed him with a fluctuating, petulant interest. Now he eagerly cried, "You said I might see her again;—that I might kiss her hand."

"Yes, yes; but pray be patient. She's not half ready yet to receive you. Aren't you interested in the process of her creation?"

"Indeed I am, but only let me see her for a moment, then I'll gladly listen to you."

Slightly offended, Goddard lapsed into a moody silence.

Broderick got up and paced the length of the floor three successive times—then exclaimed, "For God's sake, speak. I can't stand this suspense. Tell me more about Eve."

"Please be seated and compose yourself. You want to know how I accomplished this great and wonderful task? Hasn't a possible means suggested itself to you? I was obliged to waste a great deal of time in futile study, observation and experiment before I arrived at the right solution.

"At first I thought I could encompass my purpose through eugenics, which is nothing more than the application to the human race of familiar rules, which have been practiced for centuries in the scientific breeding of other animals. But the fault with this method is that, although it is possible to develop strongly some peculiar or characteristic variation, it is not so easy to remove completely those irregularities which make an organism imperfect.

"Take a specific instance. Let us assume that we have found a woman whose only flaw is a small nose. We may mate her with a man who is nearly perfect except for a nose which is a trifle larger than it should be. From this union we might expect to produce a child with a well-proportioned nose, but we can have no assurance that the progeny may not have a nose which is either larger than its father's or smaller than its mother's. Then, too, the matter of sex variation introduces an element of uncertainty; and, worst of all, experiments of this sort require an inordinate amount of time, besides being attended by overwhelming difficulties, the nature of which you can readily surmise."

Broderick became restless again. "Yes, but Eve," he rudely interrupted.

"I'm coming to her in just a minute. She is what might be called a synthetic woman; she was made by combining the complete living parts of no less than twelve different women."

Aghast, Broderick stared at him. "I don't understand you," he stammered.

"You must have heard of bone grafting, homoplastic transplantation, and other marvels of modern surgery. Perhaps you are familiar with some of my attainments along that line."

"I remember reading about a girl whom you treated after her face was badly burned. Didn't you cover her cheek with the skin taken from her thighs?"

"YES. That is a very simple operation. Those involving the transplanting of organs and limbs are much more difficult, yet not impossible to the surgeon who knows his trade. As early as 1908, Debert succeeded in grafting the lower leg of one dog to the thigh of another, in such a way that it appeared perfectly normal. It was even before that time that Lexer, using the method of juxtaposition, transplanted the entire knee joint of a child. But more wonderful still is the work of Alexis Carrel, who, you know, invented a method of joining large blood vessels by clamping them to stop the flow of blood and then sewing them

together with silk thread. I have conducted a large number of experiments on animals and human beings, and have improved the methods of Lexer, Debert and Carrel.

"But I am more of an artist than a surgeon. Surgery is my vocation and art my avocation. It therefore occurred to me that by combining my artistic taste and my surgical skill, I could model in flesh and bones, just as the sculptor models in clay. Taking another hint from the artist, I resolved to create a living woman of unsurpassed beauty, by joining together parts which, though taken from imperfect individuals, were themselves free from flaw.

"Of course it was necessary that the greater part of my composite woman be taken from one body, since it is of course extremely difficult and dangerous to make many alterations in the so-called vital portions of the human anatomy—the head and the torso. My first task, therefore, was to find a woman who embodied perfection in these essential parts.

"I finally discovered, in the person of a young woman for whom I set a broken leg, all the qualities which I required. By good fortune, she, like yourself, was an orphan with no near relatives living. She had an independent income of about eighteen hundred dollars a year. A well-known university had granted her a bachelor's degree, although she was only seventeen years old. Her interests were mainly for art, literature, and music, but she had also done work in science and philosophy. She was very fond of all forms of outdoor sport, in fact it was while skating that she sustained the injury which first brought her to me.

"Her torso, her neck and her head were absolutely perfect, although the other parts of her body were susceptible to improvement. You may fancy the delicacy with which I broached my purpose to her. Finally, by appealing to her devotion to art, and to the feminine ambition to surpass all others in beauty, I won her consent. She became my adopted daughter, and the heiress to my entire estate.

"I began by providing Eve with a new head of hair. Her own hair was pretty enough—a glossy amber brown,—light and fluffy,—but bobbed, as is the case with nearly all women today. The scalp she now wears used to belong to a Norwegian servant girl, from whom I bought it for five thousand dollars, giving her Eve's hair in exchange. When Ingemar recovered and found that she still had a full head of growing tresses, she was immeasurably pleased. She said her long golden hair had always been too much of a bother to her anyway, and she liked her new hair better.

"In a similar way, I exchanged Eve's imperfect parts for flawless members from other girls, who consented to the transfer for considerations varying from one to twenty thousand dollars. Her ears belong to an English girl, and her lips used to grace a French beauty —but her nose is her own; I merely remodeled it a trifle, reducing its size by removing portions from the inside.

"I got her left arm from a girl who is an expert swimmer, and her right from one who loves tennis, but hadn't played enough to overdevelop it. Two dancers, chosen from among five hundred chorus girls supplied her legs, at ten thousand each. I found it easier to induce two women to trade each a leg, than to get one to take the risk of sacrificing both limbs. Besides, it very rarely happens that both arms or both legs of any one person are perfect mates.

"The feet belonging to this pair of legs I could not use. They were too deformed by the combined effects of tight shoes and walking on the toes. It was exceedingly difficult to find two perfectly formed feet. Those accustomed to being imprisoned in modern shoes were cramped and abnormal, while the feet of European peasant girls who had always gone barefooted were too coarse and large. I solved the problem by selecting a girl who had always worn sensible shoes, and having her go barefooted for two months before I operated on her.

"I had the hardest job in obtaining a perfect right hand. Her left hand I bought from a masseuse, who was willing to sell her other one also, but I couldn't use it on account of a tiny scar on her little finger. Finally I found a perfect mate to her left hand on the person of a musician. She refused to sell her hand at any price, and I actually had to kidnap her. When she discovered that I intended to take her hand by force, she agreed to submit voluntarily for twenty thousand dollars. Four months after the operation, she was able to play the piano as well as ever. It was just six weeks ago that I put the finishing touches to my masterpiece. Now Eve is completely perfect."

"You speak of exchanging member for member," said Broderick, "I don't understand how you can do that."

"MY assistant, Doctor Mann, and I work together. He removes the member from Eve while I am separating the corresponding part from the other woman. Every incision and cut made by me is reproduced with mathematical exactitude by him, so that the surfaces of the severed portions are precisely identical in outline. Then, while the members are still warm and living, they are exchanged and attached by methods with which every surgeon is familiar. While I am fastening the new part to Eve's body, Doctor Mann performs a similar operation on the other girl. In a month, both have complete and perfect use of their new limbs."

"But surely, all this horrible cutting and slashing must leave some marks."

"Why so? Haven't you ever cut yourself with a razor, and watched the wound heal? In a week or two, the skin over the injured place cannot be distinguished from the rest of your face. It is thus that the skin grows over the places where the parts are joined together. You shall see for yourself. Eve must be ready by now." He pushed the button, and once more the curtains spread apart.

The woman who stood in the opening was attired in the flowing white draperies of Greek antiquity. Except for light, corded sandals her feet were bare. Her hair was parted in the middle, and was gathered in a high roll at the back of her head, from which fell

a thick cluster of curls. It seemed a perfect picture.

At a gesture from Goddard, she stepped forth, every movement a reflection of superb elegance and grace, combined with a singular suggestion of alertness and power.

"Eve," said Goddard. "Let me present Mr. Charles Broderick."

She inclined her head slightly, and held out the faultlessly manicured hand of the masseuse. Broderick took it as if it were a piece of priceless, fragile china. The mere contact of her warm, magnetic fingers sent through his frame a thrill such as he had never before experienced.

"May I kiss it?" he asked in a trembling voice.

A quizzical smile from Goddard. "Young man, never ask for a kiss. If you want one, take it." Broderick lost no time in complying, with fervid lips, to the suggestion of the older man, who continued: "That may not be sound ethics, but it's good practical common sense. Now see if you can find where that hand joins on to the forearm."

In vain Broderick searched for a scar. Not a scratch, or blemish could he discover.

"Here is where I attached her arm," said the doctor, running his finger over her bare shoulder. I'll defy you to find a mark of the joint. And you remember what I told you about her lips? Would you suspect that they ever belonged to anyone else?"

"Never! Oh, that I might kiss those luscious lips!" And, suddenly recalling Goddard's bit of philosophy concerning osculation, he thrust his arm about her neck and made a sudden effort to kiss her mouth. The doctor stopped him just in time. A crimson flood mantled Eve's cheeks, to the great delight of Broderick, who thus perceived that she was really human and not merely an animated statue.

"Take your time, rash youth," the doctor laughed. "Helen of Troy was not won in five minutes. Eve's lips are not for you—unless—"

"Unless?"

"Unless you agree to certain essential conditions."

"Name them."

"It is a long story. Eve knows it already, and so will not be interested. You will excuse her while I explain."

With supple lithesomeness, she stepped to the door. Broderick's eyes followed her until the curtains closed behind her.

Then he turned to Goddard with, "Now for the conditions."

"As you doubtless have surmised, I am looking for a mate for Eve, but he must be as perfect as she is. Since I prefer a college bred man, I enlisted the aid of the physical directors of every large university in the United States. Out of over a hundred candidates sent to me, only three have passed the rigid examination to which I personally submitted them. I'll speak of the other two presently.

"You've been with me now for a week, and my tests have shown that your health, vitality, and your intellect are all excellent. You have no physical defects, except in parts capable of being interchanged.

"What I wish to do is to reconstruct your body, just as I have done in the case of Eve, and thus transform you into a perfect man. This accomplished, you shall marry Eve, assuming the name of Adam Goddard. Thus I expect to found a new race of perfect beings bearing my name.

"The other two men I spoke of passed in all but the last crucial test. One of them went so far as to allow me to put him on the operating bench, but lost his nerve with the first whiff of the ether.

"It is not necessary for you to give your answer today, in fact, I'd rather you would take plenty of time to decide. This is a momentous matter, and is not to be entered into lightly. It will be attended by considerable pain, and some danger, although both these features will be reduced to the minimum. You may see Eve every day if you wish. To-morrow evening at eight-thirty you will be given an opportunity to test some of her mental powers. You'll be here?"

"I certainly shall."

"In the meantime, take good care of your body. To me, it is worth a million dollars."

A Game of Chess

IMAGINE, if you can, the emotions which surged through Broderick's mind as he strode back to his hotel.

Eve had made a profound impression on him—had charmed and fascinated him with her incomparable attractiveness. But he was not in love with her, he told himself, any more than he could be in love with a beautiful statue. How could he love a woman with whom he had not even exchanged two words of conversation? One thing, though, he could not escape—she completely dominated his thoughts, to the exclusion of all else, preventing him from sleeping that night or from engaging in any serious occupation the following day. More and more strongly came the realization that, having seen Eve, the society of all other women would, now and forever, seem insipid. Yet his involuntary admiration for her was rudely tempered by two shocking thoughts; one was the domineering influence which her foster-father exercised over her, and the other was the repulsive notion that she was stuck together, like a picture puzzle or a crazy patchwork quilt.

Repelled as he was by these considerations, they were far outbalanced by the overwhelming force of her many attractive attributes. Three-quarters of an hour before the appointed time, he presented himself at the door of Doctor Goddard's lordly residence.

"You're early," the doctor greeted him.

"Am I? Is Eve at home?"

"Yes. I'll send your card up to her. She'll be down in a few minutes. You're fond of chess, aren't you, Broderick? I judge so from the fact that you represented Princeton in the last cable tournament with Oxford and Cambridge. I've arranged to have you play chess with Eve this evening, if you care to."

Broderick suppressed a smile. "Who ever heard of a woman who could play chess?"

"You will remember questioning the existence of a

perfect woman yesterday. As then, I'll answer—judge for yourself."

He drew from a corner a small, beautifully finished table with a chessboard inlaid in squares of ebony and basswood. The pieces were of ivory, exquisitely carved. The doctor began placing them on the board.

"Let me see, Queen on her color, isn't it? I haven't played for such a long while, I've almost forgotten. Ah, here comes Eve."

Broderick's eyes were already fixed on the green curtains, as if loath to miss a single instant of delight in her loveliness. They parted and she appeared, bearing fresh causes for wonder and admiration. Now her figure was veiled in the graceful folds of a short-waisted empire gown, which smacked of the middle ages, yet suggested the trim smartness of modern fashion. Her arms and neck were bare. The style of her heavily massed golden tresses reminded him of the helmet of Minerva. She bowed, but did not utter a word, as she sat down in the chair which the doctor placed for her.

"White to move, and win," Goddard chuckled; and she immediately responded by leading with her king's pawn.

Broderick played an indifferent, listless game, giving more attention to his opponent's face than to her moves. But suddenly he woke up to find one of his bishops in direct line with an unprotected castle. Without giving the usual careful inspection of the other pieces he swooped down and removed it from its corner. Instantly Eve reached across the board and removed a pawn, putting in its place one of her bishops. Since this placed his king in check, Broderick could do nothing else but take the bishop with his knight. Eve removed the horseman with her queen, which was thus placed in the square next to the king, but protected by a knight.

"Checkmate!" laughed the doctor.

"By Jove, so it is. That's a new one on me. It's almost the same as the fool's mate."

"A modification of it which Eve invented herself. The rook was just left for bait."

"She won't catch me napping next time."

The pieces were replaced, with the whites on Broderick's side of the board. There was no more careless dawdling after that. He started out with the fierce aggressiveness which had won him fame in college matches, but still kept every piece carefully protected. Eve played a defensive game, anticipating his complex plots with the weird magic of a sooth-sayer, and foiling them with consummate ingenuity. He realized that he had met an opponent worthy of his skill; and for the moment, his fascinated interest in this unusual game, overcame the distracting magnetism of her beauty.

He gleefully felt that he had the upper hand, however, and came near venting his satisfaction in a vain boast, "Checkmate in three more moves." Luckily for him, he restrained this ungentlemanly impulse; for Eve, by an unexpected exchange of queens, suddenly broke through his line of attack, and put him on the defensive.

Broderick fought like a cornered lion, and finally won his way out of a precarious hole, by a series of judicious swaps. He had one piece to the good, and he knew that any even exchange was to his benefit. Finally, after over an hour of playing, he found himself with a rock and a knight, while she had only a single pawn to support her king. He moved the castle to a more advantageous position, where, however, it did not bear on her king. With seeming unconcern, she removed her solitary pawn from the protection of her king, placing it directly in the path of the threatening castle. No sooner had Broderick swept the last pawn from the board than Doctor Goddard slapped the table and yelled, "Stalemate. She can't move, and she's not in check. The game is a draw."

"Well, so it is." He glanced at Eve. The smile on her face was not one of triumph. He knew by the glitter in her clear blue eyes that she, like himself, was a keen lover of the game, and that she played for the sport and not for the pleasure of winning.

Goddard snapped open his watch. "Hello, it's past Eve's bedtime. She has to keep regular hours, you know. Mr. Broderick will excuse you now, my dear. If he wants revenge, you can give him a chance some other time."

Without a word, she arose, bowed to the two men and gracefully withdrew.

"Well," said Goddard, "what's the verdict?"

"She certainly knows how to play chess, or else I'm a dub."

"To-morrow, if you wish, you may have an opportunity to test her physical skill. What is your favorite outdoor sport?"

"I have three favorites—skating, swimming and tennis."

"Eve skates and swims unusually well, but tennis will be the best. Shall we say to-morrow afternoon at three?"

"That suits me all right."

A Perfect Sportswoman

THAT night, in the seclusion of his chamber, Broderick was beset by a multitude of unusual ideas and conceptions, some of them felicitous, others distressing. The methodical mind of a chess player he had never expected to find in a woman, and this added another strand to the chord which he felt binding him to her. "A woman who can play chess like that would certainly make a man's home life attractive. He wouldn't need to go to the club for recreation."

Thus he reflected, showing that he was a true devotee of the ancient game of war.

But, though her prowess at chess was to him an indication of superior intellectual caliber, yet the mysterious control which her foster-father seemed to exercise over her suggested mental weakness. Broderick even harbored a suspicion, that Goddard's own mind had engineered his defeat, and that he had merely used Eve as a human tool for translating his thoughts into acts.

Fulminated in his brain the realization that he had never heard her speak. Was she deaf and dumb? Surely

not deaf, since she responded immediately to suggestions addressed to her.

At the end of several hours of musing, Broderick was certain of only one thing—he wanted to see her again.

The tennis match took place at the appointed time on Goddard's private court. Eve was more delectable than ever, for she had shed her unnatural air of statuesque antiquity and was a thoroughly modern girl of the great outdoors. She was attired in a short wide skirt of white flannel and a low-necked, short-sleeved middy blouse. Her blond hair was coiled in thick braids around her head.

Doctor Goddard acted as umpire, calling the score after each point. Eve served first. She began by sending a swift twister which fell just inside the corner of the court, and spun along, hardly an inch above the ground.

"Fifteen love," Goddard called.

In the other court, Eve served with her left hand, with equal speed but not quite so much English, and Broderick hooked over a neat back-handed Lawford.

"Fifteen all," and thus the match progressed, with the honors close to even. Nearly all were deuce games, and hotly contested. Eve played a clever, heady game, putting unusual cuts on the ball, and placing it in out of the way corners. She was constantly shifting her racket from one hand to the other, and seemed equally skilful with either. Broderick depended more upon speed than generalship and won most of his points by vicious chops and tearing smashes.

At the end of an hour of playing, the score stood at eleven and twelve, with Eve serving. Two beautiful Lawfords and a lucky stroke which sent the ball against the top of the net so that it dropped gently into his opponent's court, won three successive points for Broderick. Then Eve made a superb burst of unusual speed and brought the score up to deuce. Time after time, he smashed her left-handed serve, but each time she recovered the point from the other court. At last, with the score at " 'vantage out," she served a ball which Broderick had no difficulty in returning. For several minutes, the ball danced back and forth over the net, then Eve drove a pretty Lawford into his back-hand court, immediately following it up to the net. By wonderful footwork, Broderick reached the ball and returned it, but Eve met it at the net and sent it crashing into the opposite court. It bounded fully twenty feet in the air. Broderick dashed back and leaped for the ball, meeting it squarely, but in doing so he crashed into the back-stop, and fell to the ground in a heap.

His high lob fell but a few feet on the other side of the net, where his opponent was ready to receive it. She could have easily dropped it in the center of the court where he could never have reached it; but instead she struck it underhand, sending a rainbow lob to the back court. It gave Broderick just time enough to regain his feet and send the ball back to her. At the end of thirty more seconds of playing, Eve misjudged one of Broderick's smashes and sent it into the net.

"Game and set. Score thirteen to eleven," announced the doctor. "Broderick, that was marvelous playing."

Broderick leaped the net, grabbed her extended hand, and panted, "Thank you for a wonderful game. You're the best woman player and the finest all around sport I've ever met."

She smiled and bowed in acknowledgement of this splendid compliment, but said nothing.

"Do you want to play any more?" This from the doctor.

Broderick, who was drenched with perspiration and still puffing, answered, "I've had enough for today."

"Yes, that was enough for anyone. I don't care to have Eve over-exert herself. Now you'd better both hurry back to the house and take your showers."

After a refreshing bath and a change of raiment, Broderick joined Goddard in the library.

"Well, how do you like her tennis playing?"

"I certainly enjoy playing with her. She's a clean sport, and refused to take advantage of my accident. After beating her I couldn't very well say that she is an exceptionally good player, but it's the first time I've ever played a twenty-four game set."

They conversed for some time, then Broderick, with an apparent display of embarrassment, said, "There's something that's been worrying me, Doctor, and I'm anxious to know the truth—Is Eve dumb?"

"Dumb?" Goddard exploded. "I should say—But as usual, you'll have to judge for yourself. Come around to-morrow night at eight."

The First Musicale

WHEN he arrived the following evening, Broderick was ushered into the music room.

"I've arranged a private musicale, or rather recital. Eve will entertain us, if you care to have her do so."

"I'd be delighted," was the trite response.

"The first number will be a piano solo. Have you any special preferences in music?"

"I'm very fond of Grieg."

"Very well, we'll have the suite from Peer Gynt."

It was arranged with all the formalities of the concert hall. Eve was dressed in a modern decollete gown. She stepped to the grand piano and immediately struck the opening chords of the Morning Mood. The trill of the lark, the ripple of the brook, all were marvelously counterfeited in this superb combination of tones. Then followed the lugubrious strains of the Death of Asefi the weird, oriental cadences of Anitra's Dance, and last of all the grand climax of thundering chords which culminated in the Hall of the Mountain King.

"Thank you very much," was Broderick's sole comment.

"Next will be a vocal solo," the doctor announced. The younger man held his breath in blissful expectation. At last he was to hear her voice. He was not disappointed, for her tones were characterized by a rich mellifluence which appealed to his layman's musical sense far more than those of any professional diva.

The piece she sang was unfamiliar to him, but was fraught with intricacies in the form of runs and sudden transitions from low to high notes, which displayed

unquestionable technical skill. It fascinated him, but not nearly so potently as the exquisite lyrical orchid, "I love you truly," which she sang as an encore.

At the close of this selection, Doctor Goddard arose; and, offering a conventional excuse, quietly withdrew. Left alone with the perfect woman, Broderick experienced a singular shyness, which was entirely foreign to his nature, for he was usually quite at ease in feminine society. He wanted to pay her a compliment, yet hesitated lest it sound like the adulation of a sycophant. At last he said, "You have a beautiful voice, Miss Goddard."

Without a suggestion of conceit or feigned modesty, she answered simply, "I'm glad you like it. But I know you sing also. Won't you try this with me?"

She opened a sheet of music, which was by no means unfamiliar to him. It was a duet in which the woman's voice and the man's took alternate parts, finally blending into a united, harmonious appeal:

"Oh love, stay one moment, oh love, stay one moment;
One moment of ecstacy, thy heart throbbing on my breast.
Life's long dream is o'er, life's dream is o'er.
Farewell, farewell."

So perfectly did their voices blend that an expert critic would have judged they had practised together for months. Several other songs they essayed, some complex, some simple; some sentimental, others humorous.

At last she turned to him with a smile and said, "Pardon my seeming inhospitableness if I remind you that my father is very exacting and insists that I retire promptly at ten. I know you won't be offended, and I hope we are good enough friends to be perfectly frank with each other. But before you go, I want you to promise to bring your violin with you next time you come."

"But I play only in a very amateurish way."

"We are both amateurs, and enjoy our art all the more because we pursue it for pleasure alone. From your singing, I know you have the soul of a musician. You'll bring your violin and your favorite pieces of music, won't you?"

"If you wish. And may I see you to-morrow evening?"

"I shall be very glad to have you call to-morrow."

The following evening Broderick found Eva alone in the music room. She rose from the piano bench to greet him.

"Father is working at some experiments, and asks to be excused."

A courteous bow was Broderick's response; but he did not stultify himself by any insincere expressions of regret.

"I see you didn't forget," she remarked anent the instrument case which he carried.

"No, I didn't forget, much as I hesitate to play before you. Please don't be too critical, will you?"

"I don't expect to have anything to criticise. Shall we try something right away? I just love to play accompaniments," and she struck the A key on the piano.

Imbued with the desire to make a good impression, and inspired by her faultless accompaniments, Broderick played with a brilliancy and ferver which astonished himself. Evelyn complimented him in the most cogent manner possible, by continually asking him to play more.

At the end of an exquisite Strauss waltz, she exclaimed, "Oh, wouldn't that be wonderful to dance to? I wish we could play and dance at the same time."

"Do you like to dance?"

"Indeed I do. I enjoy dancing better than any other form of amusement."

"There's the phonograph," he suggested.

"And we have the record of that very waltz. I'll start it while you roll up the rug."

A moment later, the phonograph began to send forth its regular cadences, and Eve fluttered into Broderick's arms. He was accustomed enough to the feel of a woman's body in close proximity to his, but Eve was unquestionably different. The fragrance of her hair, the gentle heaving of her womanly bosom, the touch of her fingers on his arm thrilled him with ecstatic, yet pure emotions.

And if she charmed him by her mere proximity, her incomparable skill as a dancer fascinated him. Though he danced with original abandon, following no set rules or conventional steps, she followed him as if her muscles were dominated synchronously by the same nerves which actuated his.

The great clock in the hall boomed out ten resonant strokes.

"The witching hour," smiled Eve. "I have a fairy godfather who is more exacting than Cinderella's godmother by two hours; and unless I obey him, I am in danger of losing the gifts he bestowed upon me."

Broderick took the hint and his departure.

The Proposal

THE daily meetings soon became a matter of custom rather than appointment. Though her chess playing, her athletic prowesses, her music, and her dancing had in turn attracted and charmed him, Broderick soon discovered that he enjoyed conversing with her most of all. There seemed to be no subject in literature, art, science or philosophy interesting to him, which was not at least passably familiar to Eve. He learned that she had been abroad for a year, and had a fluent command of French, German, Italian and Spanish.

One evening the talk turned to John Stuart Mill. "What is your idea of perfect happiness?" she asked.

Fervently he responded, "My idea of perfect happiness is to hold you in my arms and press my lips against yours."

Surprised and hurt by his seeming rudeness, she frowned, "Oh, you don't mean that. It's so unworthy of you."

Genuine contrition gripped him. "No, I didn't mean it exactly that way. But if you ask me to paint a picture of Paradise, it would include a little six-room bungalow, presided over by the one perfect woman in the world.

There would be a lawn, and a garden, and two or three youngsters to rush out and meet me when I came home tired after the day's work."

"That's a little better."

"Oh, it's very commonplace, and rather lacking in ambition, I know, but I'm dreadfully selfish, and I think that the greatest happiness comes to a man through his own home and family. Now tell me what your idea of happiness is."

"Oh, I've had such lofty aspirations—altogether impossible and impractical, I fear. If I could only accomplish something really big—something which would be a blessing to all humanity—like the invention of the radio, for instance, then I should indeed be happy. But, of course, that can never be. So I do the next best thing, and get all the pleasure I can out of working with my hands for those whom I love. Would you like to see my workshop?"

Anticipating his assent, she led the way to a small room at the rear of the building. "Here is *my* room. I consider it more characteristic of me than my sleeping chamber. Father won't let me have all the apparatus I'd like, for fear I'll injure some of my precious members, but I manage to do some work in brass and leather."

Broderick cast interested glances about the room. He was struck with the neat orderliness, which nevertheless did not seem to remove the impression that it was put to frequent use.

As Eve saw him stop to inspect an object lying on the bench, an involuntary cry escaped her. A second look explained the cause. The article was a card case of leather, beautifully embossed, and Broderick was astounded to see his own initials worked in the cover.

"Oh, I didn't want you to see that. I made it for you. To-morrow is your birthday."

"Why, so it is. I'd forgotten it myself. How in the world did you know?"

"I got it from the application blank you made out for father."

"It certainly was thoughtful of you. I wish I knew how to express my appreciation. May I keep it now?"

"Yes, with my best wishes."

"Thank you. And now I want to talk with you about a matter of great importance to both of us, something which we both must have had in mind right along, though we have scrupulously avoided mentioning it. You know what I mean?"

"You mean father's proposal?"

"Yes, and I want to supplement it with a proposal of my own. First, let me tell you that I love you very, very much, so much that I can think of nothing else. Then I want to ask you if you, of your own free will, without thought of the obligations you owe your foster-father, agree to the proposition he made me. In other words, do you wish me to submit to the operation which he purposes to perform on me?"

"Not unless you feel inclined to agree of *your* own free will."

"But I do feel so inclined. I'd do anything in the world for you, Eve."

"Then it will please me very much to have you do what father asks of you, otherwise I cannot marry you."

"And from now on, you and I are engaged?"

"Not yet. I have made a promise to father. Not until after—"

"I shall see him to-night, and tell him that the sooner he starts, the better it will please me."

The Operation

DOCTOR GODDARD had anticipated Broderick's decision almost to the minute. He had everything in readiness for the first operation, even to the man who was to provide the new member—a perfect right leg.

The scenes of the operating room were new to Broderick, who had not experienced a sick day since childhood. With undisguised interest he watched the careful preparations; and when the sickening reek of ether reached his nostrils, he welcomed it as a harbinger of new experiences. Heavy, irresistible drowsiness slowly took possession of him; then he had the sensation of falling, or rather drifting through space; and finally came a thought-free void.

When he again recovered consciousness, he found himself lying on a bed in a many windowed room, which seemed filled to the bursting point with sunlight. Doctor Goddard was bending over him.

"How do you feel?"

"Oh, all right. Just a little dizzy and sick to my stomach."

"That will soon pass off. Does your leg ache?"

This was the first reminder of the reality of the operation. At first he was not sure that he had a right leg, and he had to feel with his hand to make certain. He was surprised at the touch of his bare skin, instead of the bandages he had expected. Very cautiously, he wriggled his great toe. It seemed to work very naturally.

"May I move my leg?" he asked.

"Surely. You can do anything you want with it."

Broderick elevated his knee, twisted his ankle, and began to kick like a man whose foot has fallen asleep. Then he threw back the covers of the bed and sat up.

"Try to walk on it," suggested the doctor; and Broderick complied, with the tread of a man suffering from a severe attack of the gout. Five minutes of cautious limping brought him to a chair. Here he sat down, and began to examine his right leg. With a puzzled expression on his face, he appealed to the doctor. "Do you know, that leg looks exactly like the one I've been using for the last twenty odd years?"

Goddard smiled. "It *is* the same one."

"You mean you didn't perform the operation?" Genuine disappointment was echoed by the question.

"No, I didn't undertake it. Get into your clothes, and I'll explain."

"First," the doctor continued, "I want to apologize to you and to confess that I have deceived you from the very start. Eve is not an adopted child but is my own natural daughter. Moreover, she is not perfect, though she comes as near to it as careful nurture and training could make a woman. As for my scheme for creating a perfect being, that was but a yarn invented for the

occasion. It is accurate enough in theory, but I do not feel far enough advanced to undertake it in actual practice as yet.

"You naturally wonder what it is all about. To me, Eve's happiness is the most important consideration in the world; and I believe that she can only attain happiness through marriage with a man who is all that a man should be. There was just one thing concerning which I wanted to assure myself, and the story of the perfect woman was the last crucial test. This you have passed successfully, and you have convinced Eve and me that you possess the highest form of courage—the courage which prompts a man to risk life and limb in the interests of science and human achievement.

"Now, I suppose you would like to see Eve. You will find her in the room where you first met her. And, before you go, perhaps it might interest you to know that the nude figure you saw that first day, was nothing but a life-sized oil painting, which was so well done and so skilfully lighted that it looked just like a living woman. No doubt you've heard of 'Stella' and similar illusions."

With a mumbled commonplace of some sort, Broderick left the room, and, his mind teeming with intoxicating, puzzling thoughts, strode along the corridor.

He found Eve clinging to the curtains through which she had first stepped into his life.

Anxiously she greeted him, "Has father told you?"

"Yes. Everything."

"And now that you know, what do you think of me?"

By way of answer, he gathered her up in his arms, and crushed his lips to hers in a fervid, suffocating kiss. "That is what I think of you," he panted. "I love you a million times more, now that I know that you are a real woman, and that every part of you is your own dear self."

"But I'm far from perfect."

"To me, you shall always be more than perfect—my superperfect bride."

"Are you sure you have no fault to find with me?"

"There have been only two things about you that I objected to. One was that you were supposed to be created in an unnatural way, but that, of course, is removed now. And the other—"

"Yes?"

"You don't mind if I tell you? The other was the dominating influence which your father seems to have over you."

"Father dominating me?" she laughed. "My, but that's rich! Why, I just twirl Father around my little finger. He does everything I tell him to. Listen. I met you once at a party, years and years ago. You don't remember, because I was a mere youngster and therefore beneath your notice. But I have never forgotten; and—well—the fact of the matter is that you were picked out, not by father, but by *me!*"

THE END

What Do You Know?

READERS of AMAZING STORIES have frequently commented upon the fact that there is more actual knowledge to be gained through reading its pages than from many a textbook. Moreover, most of the stories are written in a popular vein, making it possible for any one to grasp important facts.

The questions which we give below are all answered on the pages as listed at the end of the questions. Please see if you can answer the questions without looking for the answer, and see how well you check up on your general knowledge.

1. Give a typical fourth dimensional equation. (See page 296.)
2. How did Carrel, the famous surgeon, join blood vessels in living subjects? (See pages 302-303.)
3. Can you give a resumé of the development of the basic laws of energy? (See page 310.)
4. What new alloy of high permeability has been discovered in one of the great electrical laboratories. (See page 312.)
5. What is plankton? (See page 366.)
6. What are the characteristics of the famous stone images on Easter Island? (See page 366.)
7. Where is the Agassiz triangle? (See page 368.)
8. What examples of the temperatures endurable by man can be cited? (See page 336.)
9. In Europe, the winter just past was of unusual severity. What other winters of great and prolonged cold are on record? (See page 336.)
10. Give some examples of low Arctic temperatures. (See page 336.)
11. Why did not the passage from Bering Strait to Baffin Bay in the middle of the last century demonstrate the existence of the northwest passage, finally traversed by Amundsen in an auxilliary motor vessel, "The Gjöa" in the present century? (See pages 346-347.)
12. What is the coloring matter in red snow? (See page 352.)

The FLYING FOOL

By David H. Keller, M.D.

Author of: "The Psychophonic Nurse," "The Revolt of the Pedestrians," etc.

ROBERT SMITH gave an exclamation of astonishment. He turned to his wife and said:

"I see that Einstein has reduced all physics to one law."

Mrs. Smith was darning stockings at the other side of the table. The world that she was living in was a rather new world, but the stockings still had holes in them. In fact, the two dollar silk stockings had as many holes as the fifty cent Lisle variety used to have. Life for Mrs. Smith was not so very interesting. Even her two-year-old daughter, who had most inconsiderately arrived in the eleventh year of an otherwise uneventful companionate marriage, failed to provide the blasé wife with thrill, though she did furnish lots of hard work.

Robert Smith was an inventor. That is, he was a dreamer of great innovations by night, and a seller of laces and ribbons in a large department store in the daytime. Naturally, such a spending of the twenty-four hours did not provide his wife with the luxuries of life and, gradually, through the years, she had come to regret the fact that her husband was just plain Robert Smith instead of an Edison. Of course, when she married him she was under the delusion that he really would invent something which would make them wealthy. She now saw, after thirteen years of gradually increasing disappointment, that her husband would always remain a salesman of ribbons and laces.

THE Westinghouse laboratories have discovered a new magnetic alloy of wonderful properties, which they call permalloy. A sample of it, properly polarized, will rest in the air unsupported an inch or more above a magnet. What a mass of this highly permeable alloy would do with a huge magnet, has not yet been shown. But several ideas suggest themselves to anyone who can visualize scientific possibilities or possible future inventions as to what might happen if this metal were combined with others or if it were used in a somewhat restricted form. But Dr. Keller is well known for the unique manner in which he makes a future possibility seem a thing of current occurrence. The human interest in the story only adds to its literary value.

Her husband tried to keep her interested in his dreams. That was hard to do when she had so many stockings to darn and buttons to sew on. Besides, at the end of the day, she was tired. Also her mind had never been very much interested in higher mathematics or the laws of physics and all other interesting things that her husband felt useful to him in his nocturnal career as an inventor. Frequently, she did not even have an idea of what he was talking about, and his efforts to tell her, simply added to their mutual dissatisfaction with each other. Something of this kind happened on this particular evening. Smith said:

"I see that Einstein has reduced all physics to one law."

His wife looked up from her darning, as she said rather slowly:

"I think that is a good thing. We have too many laws as it is. What State does this man Einstein come from? I do not recall his name. But I really do not see how all the laws could be put into one law. That must be a newspaper mistake."

"Einstein, my dear, is a German," replied her husband.

"Well, of course, they have to be represented. Still, I think that they ought to be careful in regard to electing these foreigners. He may be a Bolshevik."

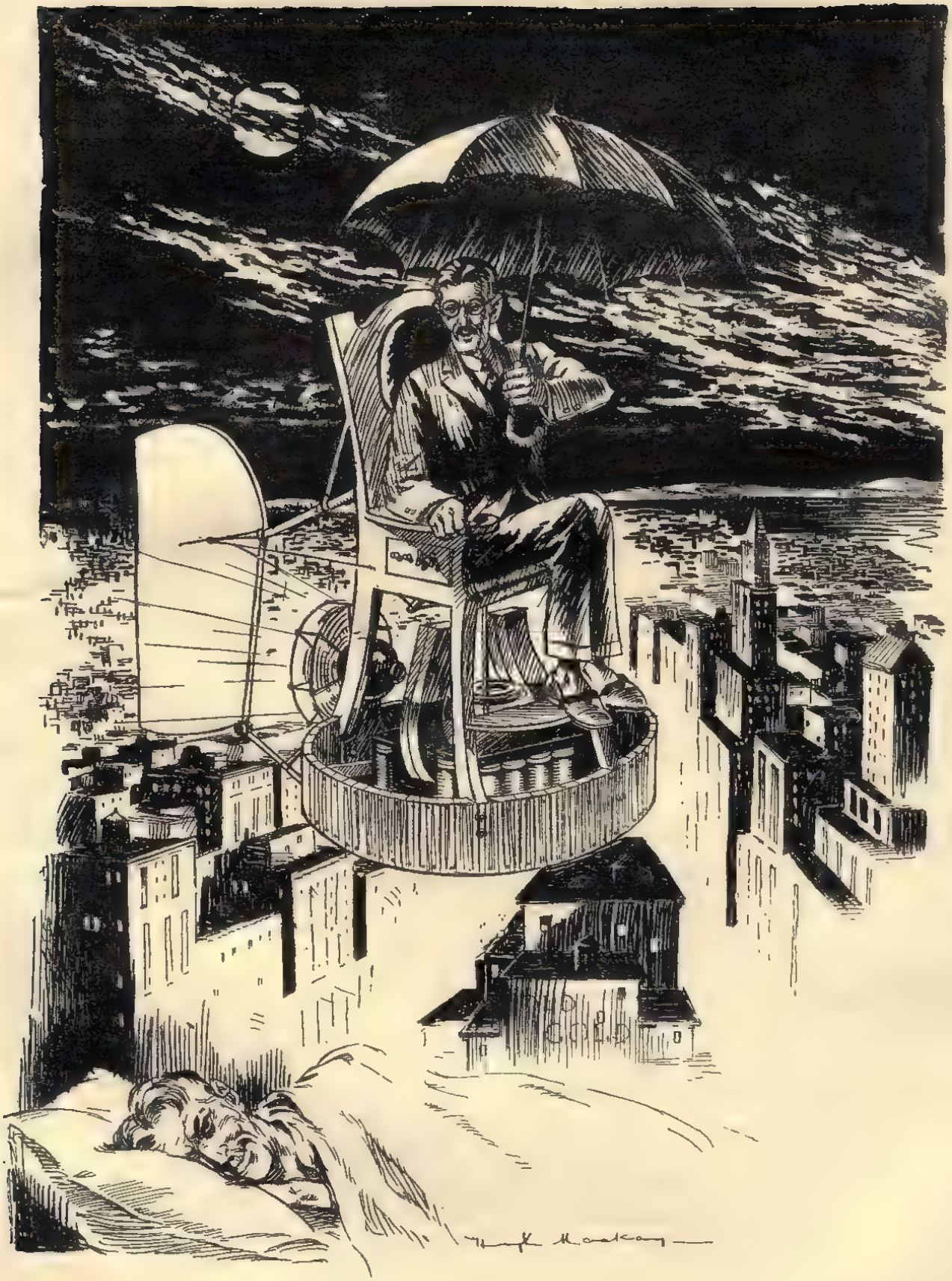
"You still do not understand. This man is not a senator. He is a scientist. When it says that he has formulated a new law, it means a law of physics. It has nothing to do with government."

"Well, why didn't you say so in the first place? You said a law. I guess I know what a law is. And another thing, don't yell at me so. You talk so loud that it is no pleasure to listen to you any more. If you would spend your evenings in taking a correspondence course in something instead of reading about things nobody understands, you would get away from that ribbon and lace counter. I showed you that paper about the Improvement Institute. A man was taking that course and he changed from a salary of twenty dollars a week to ten thousand a year, and he only studied ten weeks. Well, what about this new law?"

"It means this," replied Smith, in a rather low voice, "many centuries ago man realized that light and heat were related. Then Joule and Rumford showed that light, heat and energy are related according to definite physical laws. Thus, energy was added to light and heat. Now, gradually, the scientists have shown that to these three forces can be added matter, space, time, gravitation and electricity. The only factor absent was to determine the relation between electricity and gravitation. According to Einstein, there is only one substance, 'the field,' and this field contains electrical and gravitational components which are closely tied together by a single formula. That, to me," said Smith gravely, "is a most remarkable discovery."

"And to me," replied his wife, "it does not mean a thing."

"But you do not understand just what this means!" almost shouted Robert Smith. "This article says that it means that man can fly. Not in a plane or a balloon,



In fancy, Smith was now up in the air. Now he could stay up without turning over. He could press a button and go up, or press another button and slowly come down—like a thistledown.

but just go up in the air! The thing that holds us to the earth is gravitation. If that can be overcome, why mankind can go up into space. I believe I see something in that, a very simple machine, which could be produced for a few hundred dollars—"

But his wife interrupted him. She was led to do so by past experience.

"A few hundred dollars would pay our expenses for several months."

But Robert Smith was so absorbed that he never heard her remark. Just then the baby cried in the next room.

"Robert," said Mrs. Smith, "will you go and tend to the baby? I must finish this mending. You know it is your child as much as it is mine."

"Please stop calling the baby 'it.' She is too old, and besides, she has a very nice name."

Nevertheless, he put down the paper and disappeared into the shadows of the next room to attend to the baby.

WHEN he returned from the care of the baby, he found that his wife had gone to bed. The sounds from their bedroom indicated that she was fast asleep. So, relaxing, Smith started to read the article very carefully. He read that a New York professor was making some startling statements about the new law of Einstein. He prophesied that the time would come when airplanes would be able to remain in the air without engines or visible support; that a man, properly equipped, could step out of a twenty-story window and not be in danger of falling; and that, were it not for the deadly cold of the regions beyond the earth's atmosphere, a trip to the moon might be a very easy matter. This law provided a means for insulating the body against the laws of gravitation.

"That would be rather fine," said Smith, softly, to himself. "That would be the real thing. This air work they are doing now is too complicated. I do not believe that it will ever be popular. Besides, it is so very dependent on machinery and fuel, and a person has to keep on going. Now, my idea is to go up in the air about fifty feet and just slowly mosey around. I feel that it would be so much more pleasant than the way they do it now. Then I would want to stop, if I saw anything interesting beneath me, and stay where I was in the air till I had made a thorough examination of the particular object my attention had been called to. You cannot do that in a plane—in one of those things a man has to keep on moving or fall. The big thing would be to have a cheap apparatus, costing a few hundred dollars. Something that would go up easily, stop at any point and stay there in the air; something that would move slowly, be easily guided and in some way obtain all of its power through the air. It would have to go up like a slow elevator and come down like a feather or a thistledown.

"That would be a fine apparatus to own. A man could go on little excursions in the evening, after the wife was asleep, and it would sort of take his mind off of things. There are so many things that I would like to see from the air. I bet Broadway would be an interesting sight, or the Statue of Liberty, and it certainly would be a lark to take a piece of chalk and write your name on the top of the Washington Monument. Of course, for a long trip it would be necessary for me to tell the wife just where I was going—but, perhaps, she would have no objections if I brought back a nice present for her. Going across the ocean would be a little dangerous, but it ought to be safe to go up the Hudson. After a little practice a man could go a great distance, if he had a box of lunch with him.

"It all ought to be rather easy. All we need is a starter and a stopper, and, of course, the stopper would be just a gradual shutting off of the starting force. Then there would have to be something to cause a progressive movement in the air, something like the propeller of an airplane and something more to guide the thing with, and there would have to be a method of obtaining power from the air; of course, there is lots of power and all kinds of electrical waves, but the question of hooking the engine on to them is a different matter.

"If I could just do that—just that simple invention—I would be rich—perhaps, rich enough to educate the baby. I believe I can do it if I can only work out a few of the details. There would have to be some kind of a chair to sit on and something to keep the whole machine from turning upside down. That would be most embarrassing, even to be a hundred feet in the air and have it turn over and dump you out. I would not like that to happen—at least, not until I have more insurance."

THE next morning he was once again a seller of ribbons and laces, but it was hard to keep his mind on the delicate difference in the tints and colors and the various designs of lace. He sold these things, standing behind a counter, to dozens of ladies standing before the counter, but his soul was far away—in the air. He day-dreamed of floating up and whispering in the ear of the Sphinx, that peculiar woman who could live a thousand generations without betraying a secret or uttering a word. He thought that it would be fine to go slowly over the top of Mount Ararat and see if the Ark was still there, where it had grounded in the days of Noah. He promised himself that he would spend a Sunday over the Battlefield of Gettysburg, a place sacred to him because his grandfather had died there.

That noon, as he ate the lunch that he always brought with him from home, he feverishly read the evening paper. He was still on the trail of Einstein. It was a singular coincidence that he found one of the very facts that he was looking for. It was just a simple statement to the effect that the Bell Telephone laboratories had produced a new alloy called permalloy, which was particularly sensitive in its relation to magnetism. When a bar of it was placed above a magnet, the bar of permalloy rose in the air and floated an inch above the magnet.

That made Robert Smith do a lot of thinking. Could a man pull himself up in the air by lifting on his boot-

straps? Suppose there was a magnet and resting on it was a bar of permalloy? Both the magnet and the bar would be of the same size. The bar is repelled by the magnet to such a degree that it rises two inches above it and remains suspended in the air. What Smith could not make out was this problem. Suppose the bar was fastened to the magnet so that it could only rise one inch in the air? But is the other inch to be ignored? There is a pull there. Would it go up the extra inch? If it did, it would have to pull the magnet with it, as they cannot be more than an inch apart. If it kept on doing that, what was there to keep it from going on right up into the air? The magnet would be the same. The permalloy would always try to withdraw two inches from the magnet, and in doing so, it would always pull the magnet upward. *If it did, then gravitation would be overcome,* and if a man was seated on the bar, he would go up with the magnet and the bar.

Of course, Smith realized that certain formulas would have to be determined. Just how much should the bar of permalloy weigh in proportion to the weight of the magnet? Would the lifting ability of the bar be in proportion to its weight or in relation to the size of the magnet. How long would the magnet retain its magnetism? Could it be recharged by electrical induction while it was in the air? But to Smith's eager mind these were but details, petty trifles to be worked out after the larger facts had been determined. What he was sure of was his ability to rise in the air, provided he had a magnet and a bar of permalloy and a chair to sit on fastened to the bar.

Hastily eating his dinner, he went to a public telephone booth and called up the Bell Telephone Company. Had they any permalloy to sell? To his surprise, they said they had and how much did he want—it was ten dollars a pound—in the form of a very fine wire. He said that he would call them later, and went back to the ribbon and lace counter. He knew that he could secure a magnet without difficulty, but how could he manage with five pounds of wire? For fifty dollars was about all that he could spend. Even that was a birthday present that he had carefully concealed from his wife. Then the wonderful thought came to him. After long months of careful saving on the part of his wife, she had finally put aside enough to get a new suit for him—a real tailor-made suit. There had been several trying periods of measurements and fittings. He would take this five pounds of fine wire and have the tailor sew it in, in some way, all through the suit. Then all he would need was a chair tied to the magnet and himself tied to the chair —and up they would go.

"I may be a flying fool," he whispered to himself, "but it certainly will be wonderful."

It took him several days of going without his lunch to buy the metal wire and show the puzzled tailor just what he wanted done. Of course, this increased the charge for the suit, but Smith paid that himself out of his personal allowance. He was particular in his instructions that under no circumstance was his wife to be told about the wire. He finally obtained a promise that the suit would be delivered in a few weeks. As a matter of fact it was delivered and hung in the moth bag a full week before the rest of the machine was completed.

IN fancy, Smith was now up in the air. He had taken no time at all in perfecting a simple arrangement of wires which, when a button was pressed, would extract a powerful current of electricity from the atmosphere, and this, as everyone has known from the days of Benjamin Franklin, is constantly surcharged with this mysterious force. It was no trick at all to get the magnet and attach to it the wires. He arranged to have the starting button at the side of his chair. He was going to press the button; that would greatly increase the magnetism which would repel the permalloy in his clothes, and up they would go. When he wanted to come down, he would cease to pull the electricity from the air, the magnetic force would slowly wear out, and down he would come, like a thistledown—he liked the idea of coming down like a thistledown—any other thought made him shudder.

But the question of balance bothered him. Suppose he tilted? And turned over? Where would the pull come then? Certainly it would be difficult to enjoy a ride upside down. And landing on the ground, head first, tied to a chair, would be too ridiculous. Then he thought of the gyroscope! That solved everything. It would be the stabilizer. Nothing would be easier than to have a gyroscope under the chair. All he had to do was to make the gyroscope the wheel of an electric motor, with finely adjusted contact mechanisms to reduce to a minimum the problem of friction. He could run the motor from the same electrical source that he used to electrically induct his magnet. Now, he was up in the air and was going to stay right-side-up.

The securing of a small gyroscope was a problem that almost proved to be too great for the ribbon seller. He probably never would have solved it were it not for a friend, who, knowing of his problem, told him of a small private yacht that was being torn to pieces as junk. This small pleasure boat had an equally small gyroscope to keep it from rolling at sea. Smith found out what the cost was, and it was possible, by selling some very special jewels left him by his father to buy that gyroscope. It was very small, but it worked perfectly and fitted to perfection in the space under the seat of the chair. And it was almost noiseless.

Now he could stay up without turning over. He could press a button and go up, and another button and slowly come down, like a thistledown, and all the time the little gyroscope would keep him right side up. Now, all his problems were solved and all his money gone, and he still had the problem of moving through the air. It would not be very interesting to just go up from the balcony and stay up for a while and then come down on the balcony again, though, of course, that would be pleasant on a hot evening and rather a relief at other times. But he wanted to move. He wanted to go somewhere, if only to Coney Island. He grew rather tired of seeing his wife darn stockings —every night; though it was dear of her to do so.

Then, as a last resort, he conceived the idea of using an electric fan. He could attach it to the back of the chair, or he could fix it so that it would have a movable point of attachment. Then he could go and come and perhaps even turn around. He would not go fast—but he did not want to go fast—He just wanted to go somewhere and see something. It made no difference what it was, just so he could get away from the daily grind of laces and ribbons and ribbons and laces and more laces and starting to work every morning and back again every night and stockings—He was ashamed of himself, but he was nervous about those stockings, and he knew that it was his fault that they were not thrown away and new ones bought. Men were wearing such fancy stockings now-a-days, but he only got stockings at Christmas as presents from his wife, and from his mother.

He had an electric fan. He experimented and found, to his surprise, that he could run it on electricity taken from the air in the same way that he was securing the electric current for the motor of the gyroscope. And right there Robert Smith hovered on the edge of becoming a multimillionaire. Had he patented that little idea and protected the patent, his wife would have had no more need to darn stockings, but all he could think of at that time was going up in the air. He adored calling himself a flying fool. It sounded so very devilish.

Naturally, he could not assemble the pieces of this apparatus without his wife having some idea that a new invention was in process of birth. But she had lived through so many of these wonderful money-making plans that never amounted to a hill of beans, that this latest effort of her husband's left her cold and uninterested. She simply deplored silently and openly the fact that he was not getting more sleep, as she was sure this insomnia would result in his lowered efficiency as a salesman of ribbons and laces, and that, as she often said, was really the way that they managed to live from year to year, and it was especially important now, since little Angelica had come to live with them. She always said it that way, as though, by placing the initiative on the baby, she took from her own shoulders the burden of having made a failure of the major factor of companionate marriage.

The Smiths lived in an old-fashioned part of the city. In fact, unkind friends said behind their backs that they lived in the slums. However, their house had a balcony extending back from the second story and this balcony having no roof, it was especially desirable as a starting and landing place for Smith's new anti-gravitation machine. Two small bedrooms opened out on this balcony by French windows. The fact that the bedrooms connected with each other, made it an ideal arrangement. The baby slept in one room and her parents in the other. When she cried, it was very easy for the one who heard her first to look after her—and Robert Smith was a light sleeper.

GRADUALLY, Smith assembled his machine on this balcony. When he was not working at it, he kept it covered with an old canvas. It just looked like an old chair to his wife; so, she did not bother it, and as the weather was cold, she humored him by allowing him to use the electric fan. In her way she loved him, but, perhaps, her affection would have equaled her devotion had he been able to secure for the family a better income. However, she was really in love with him, and even if life had not brought her all she had hoped for, she was inclined to be philosophical about it. So she left his funny old chair alone, and kept on darning the stockings and trying to make a dollar buy two dollars' worth of food.

Finally, the machine was completed. Smith sat in the chair one night and tested the different parts. One button started the gyroscope, another started the fan, while a third made the fan move slowly on its metal track. There were other buttons connected with the magnet, but they were useless, so long as he did not have on his new suit. Several nights after the suit came he waited till his wife was asleep and then lovingly took it out of the moth bag. The tailor had been rather skillful in sewing the wire in through the various garments.

All was ready. Valuable evenings had been spent working on the mathematics of the invention. He wanted to be sure that it was powerful enough to carry his weight and also the weight of the entire machine. Even while he was working, the singular thought came to him that all his calculations were unnecessary, because if the permalloy was repelled by the magnet it had to take with it anything that it was attached to. Right here the idea came to him of a small circular track, with a block of permalloy on wheels, constantly retreating from a magnet on wheels. The very idea of it—the constant revolutions—why, it was almost perpetual motion—made him so dizzy that he nearly fell out of his chair, and his wife insisted on his taking a dose of calomel.

At the end of his calculations he was satisfied that nothing had been neglected. It was just a question of putting on that new suit, strapping himself to the chair and pressing a few buttons. He decided to wait till the moon was full and that would be just one more night. Then when he was sure that his wife was asleep, he would dress and soar. In a peculiar way, that was hard for him to understand, this first adventure in the air meant freedom to him, and yet he did not comprehend just what it was that he wanted release from.

All that he was afraid of was that it would rain. Of course, he knew that he could carry an umbrella, but that seemed, somehow, to be hardly suitable.

When the next evening came, he found that all of his fears had been useless. It was not only clear, it was a wonderful night. A strong wind had cleared the atmosphere; it was warm; there was hardly a breath stirring at ten o'clock, and the moonlight was so strong that it was almost possible to see the print on a newspaper.

Mrs. Smith unconsciously helped her husband in his plans by going to bed early. In fact, she was sound asleep by nine. The baby had been asleep for several hours. Smith tiptoed into their bedroom,

took the new suit, moth bag and all, and tiptoed into the baby's room. There he rapidly and as quietly as he could, changed suits. He was glad to see how well the coat and vest fitted him. On his way to the balcony he had to pass the little crib. He paused a moment, even touched the little girl's hand. She had always been a wonder to him—he never fully understood just how it was that she had come into his life—but at night, as she slept, she was almost a miracle. For a long minute he hung over the crib, to satisfy himself that she was breathing. And the love that passed between them in some way recalled another love, and he thought of his wife, of what had been, of their early hopes and ambitions and how, gradually, one by one those hopes had slowly been blasted, and now, at the age of nearly fifty, he was still a salesman of ribbons and laces. He quietly walked to her bedside—she was still a pretty woman—and he realized, as never before, just what she had meant to him and what she had done for him and sacrificed for him in all those years of their married life. And in addition, she had somehow found that little new love of his, the charming Dresden china baby, Angelica.

He bent over and kissed her hair and then, sighing, passed through the door, out on the gallery, where his soaring invention awaited him. He sat down in the chair and started to fasten the straps. Everything was all ready to press the starting button—

And the baby cried.

SMITH sat still; perhaps she would go to sleep; but she cried again.

A woman's clear voice came to his straining ears:

"Robert, can you take care of the baby? She has cried twice now and I am sure that she needs attention. I am so sleepy, and I know you are still dressed."

"I will attend to her as soon as I can," Smith replied. He unstrapped himself and went into the nursery. Sure enough Angelica needed help. With skillful, loving hands, he quietly cared for her, talking little nonsense verses to her as he did so, in the hope that she would not become wide-awake. But she did. When he left her crib, her little whimperings told him that she wanted him. She even sat up in bed and the next moment was standing up, ready to play.

He tried to persuade her to lie down. He told her that papa was building a flying machine and if she was a good girl, he would let her ride in it, like a bird some day. He had made this promise to her before, and it had always put her to sleep, but this time it only seemed to make her more excited.

"Angie fly birdie," she insisted.

Sighing, Robert Smith took his daughter out of the crib, and then the wonderful thought came to him that it would be a fine thing to take her with him. He could hold her in one arm and manage all the buttons with the other hand. It was a pleasant night, warm, and he would not go far, perhaps simply go up in the air for a while and then come right back down again. He carried Angelica out on the balcony and reseated himself in the chair. It was a little hard to strap himself in, but he finally did so, and he even found enough strap left over to put around the baby.

She enjoyed it all.

"Angelica," whispered the gray-haired man, "your father is a flying fool and so is his little baby."

"Angie fly birdie," cooed the little one.

Robert Smith shut his eyes. At last he had come to the parting of the ways. Here was freedom and adventure and perhaps romance, and he was sure that, with the baby in his arms, the romance would be of the purest variety. His heart began to beat faster; he held the baby so tight that she began to whimper—and then *he pressed the starter button.*

And waited.

Nothing happened—not a thing was different—sickened with disappointment, he realized that nothing was going to happen. Somewhere there had been a mistake.

As he sat there, the little girl went to sleep. Tired of waiting, anaesthetized by the fresh air, perhaps a little cold, she had cuddled close to her father and gone to sleep. Almost as in a dream, Robert Smith unstrapped himself and carried his sleeping daughter to her crib. She simply relaxed and kept on sleeping. Then Smith undressed—he put his new suit back in the moth bag and hung it up—and then he prepared for bed. Somehow, his wife awoke. It was a rather unusual thing for her to do this, and Smith did not understand it till she started to talk to him.

"You know, Robert, a most unusual thing happened this week, and I have been trying to find time and the right occasion to tell you about it. You know how I have planned and saved for that new suit, and how proud I was to think that at last you were going to have one tailor-made instead of a hand-me-down. Well, when that suit came, I examined it very carefully, and it had the most peculiar wire threaded through it, long pieces. I worked and worked at it and finally got it all out, and I took it to a dealer in old metals and he said he would give a dollar a pound for it, and it weighed just five pounds. So, there I had five dollars, and I spent it for stockings for you. I bought you six pairs, and they are guaranteed to be hole-proof. You needed some new stockings. I have tried to darn them as carefully as I could, but I really don't see how you could wear them, being on your feet the way you are all day. Now, how can you explain that wire in that new suit? I called up the tailor and I believe he was puzzled himself; at least, he acted so."

"It certainly is odd," answered her husband. "But I am glad you bought me the new stockings. You sew too much. Did you buy me striped or colored ones?"

"No. I thought for your ribbon and lace work it would be better to have black ones. Do you know, I am wide-awake? I want to talk. I was reading today about a man's claiming that some day men would float through the air. What do you think of that?"

"I think that any man who wanted to do a thing like that would be a flying fool!" said Robert Jones slowly. Then he forced himself to go to sleep, for the next day he would be busy, selling ribbons and laces.

THE END

FUTILITY

By Captain S.P.Meek, U.S.A.

Author of: "The Murgatroyd Experiment"

"KENNETH, there is a legal-looking letter here for you," said Rose as I entered the bungalow.

"I knew that we had a States mail today," I replied as I took the letter from her and sank into an easy chair. "This is probably a business letter delivered here by mistake."

"It's marked 'personal.'" she objected.

I tore open the envelope and glanced at the letter.

"Great Scott" I exclaimed as I sat bolt upright.

Rose hastened to my side and read the letter over my shoulder. It contained the news that Thomas Wallace of New York had died on December 11th as a result of injuries sustained in an automobile accident. It also stated that his will had been examined and that I had been named sole heir to his estate.

"Sole heir!" exclaimed Rose. "Was he worth much?"

"About twenty millions," I replied.

Rose gasped at the immensity of the sum.

"Heavens!" she exclaimed. "We're rich! Who was he, Kenneth?"

"He was a living example of the futility of human wisdom," I said slowly. "He was a man who was cursed with too much knowledge and one who fought unavailingly against fate and waged a battle that he knew from the start was a losing one."

Nine months before when the *Berengaria* docked at New York, I was one of the first men down the gangplank. I had not set foot on the soil of my native land for nearly fourteen years, and I was anxious to see how the atmosphere of the busiest city in the world would affect nerves attuned for nearly a decade and a half to Peruvian mining camps. On the dock I looked eagerly around for the friend who had promised to meet me. I saw nothing that resembled the trim athletic figure I was expecting and I started for the far end of the customs shed, when a hand fell on my shoulder and a tired listless voice sounded in my ear.

"You haven't changed a great deal, Ken," it said.

I whirled around, my hand outstretched to greet the owner of the welcoming voice, but I paused in the act of greeting him. The alert vigorous figure that I had expected was not there and it took an effort for me to recognize my friend in the carelessly dressed individual who stood before me. It was to be expected that fourteen years would take some of the bloom of youth from a man, but Tom Wallace had aged forty years in that length of time. It was not the droop of his shoulders or the lines in his face that impressed me; it was the expression that he wore. His was the face of a man who had acquired all knowledge and had tasted all pleasure and had found that wisdom was vanity and that the taste of pleasure was the taste of wormwood and ashes. His face was lined with sorrow and grief, but I have seen faces so marked that still radiated life and hope and faith in the future. I could not place his expression for a moment and then it dawned on me where I had seen a similar one. It was the same expression that I had seen shortly before his execution on the face of a criminal condemned to die. It was a face devoid of hope.

With an effort I dissembled my surprise and greeted him heartily. He shook my hand in the same tired listless way, in which he had spoken and asked about my luggage. Evidently he was a man of some prominence, for a word from him was enough to secure a Customs Inspector promptly and to pass me through in short order. He led the way to a luxurious town car which waited for us and we rolled off toward his home.

"You haven't changed a great deal, Ken," he repeated.

I hesitated for a moment over my reply.

"You haven't changed as much as you might have yourself," I said, rather tactfully as I thought.

"You used to be more truthful than that," he replied. "You might as well get used to saying what you think to me. It won't hurt my feelings at all. I'm beyond that sort of thing. How has the world treated you since I saw you last?"

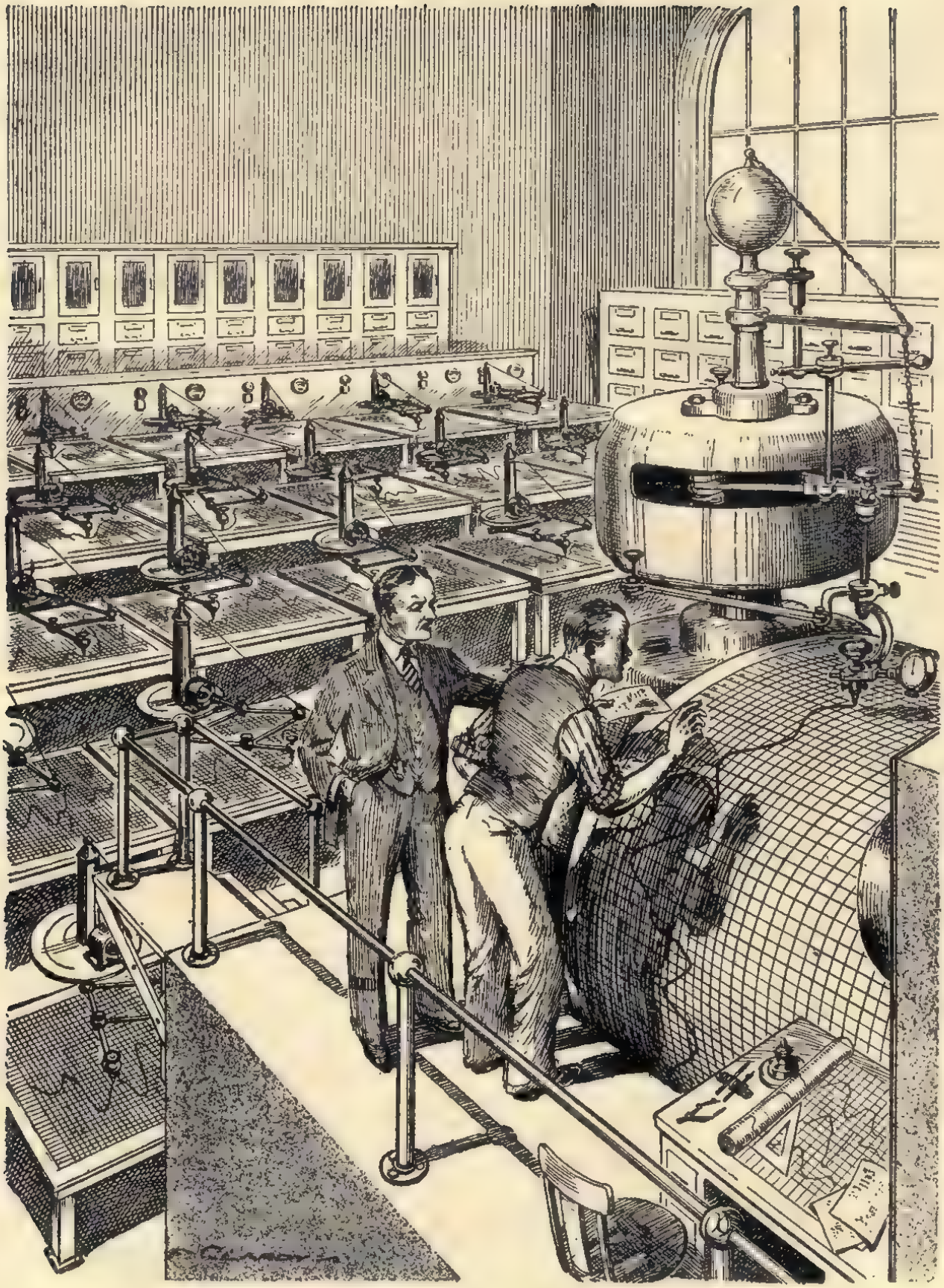
"I can't complain. I have a good position and have done some good work. I am up here now to act as adviser on a projected consolidation of our properties with those owned by our leading competitor. If the deal goes through, we will almost control the copper situation in Peru. How have you made out?"

"Ill,—or well, depending on your viewpoint. I consider it ill."

"I heard in a roundabout way that you had made money."

"Oh—money." He waved his hand contemptuously as if the thought of mere money made him disgusted. "Yes, I have made money—more money than I know

WE read perpetually of plotting curves. For instance, by obtaining the necessary data and information, the time of future tides can be predicted with exactitude. Certain machines are now in use that can solve all kinds of seemingly unsolvable mathematical problems in a very short space of time. It seems to us quite possible that some day some scientist and mathematician might attain the apparently "impossible" and learn to plot curves for human beings which will result in true prophecies. How desirable such an invention might be is another matter. Much philosophizing might be done on that score. Certainly the author furnishes food for thought.



What I have described is the machine in its simplest operation of adding a series of simultaneous curves. . . . One great improvement that we made was that we eliminated the need for an operator for each curve. One man could do the whole job.

what to do with. I have been very successful that way."

"Is your health good?"

"I haven't been sick a day in the last four years."

"Has your work gone satisfactorily?"

"If you refer to the successful completion of the problem I have spent my life on, it has gone very satisfactorily. I have completed it."

"If you have made good in your work and have good health and have incidentally made more money than you know what to do with, what in Sam Hill is the matter with you?" I demanded warmly.

"I have no future, no hope, nothing to look forward to," he answered tonelessly.

"No future, my aunt!" I exclaimed. "Why Tom, you are still young and have many years to look forward to. Think what you can do!"

"I have just eight months and four days," he said drily.

"I thought you told me that your health was good?" I asked in surprise.

"It is, as good as any one could ask for."

"Yet you tell me that you have less than a year to live," I remonstrated. "That is hot air, if I may speak frankly. Even the best doctors, and of course you have the best, are sometimes mistaken."

"I have no doctor. I will die in an automobile accident."

I looked at him sharply. There were no signs of insanity visible to my unpractised eye, but his words made me doubtful. I had read of cases of monomania of this type. Indeed I had encountered a case in a native in Peru, and I had doubts of Wallace's sanity.

"I'm not insane," he said answering my unspoken question. "I simply know. Do you remember Bob Jerningham?"

I nodded.

"He is the man who is responsible for my knowledge," he said. "However, we won't talk of it now. When we get him I'll tell you about it. I am really very glad to see you. In fact, I think that I would have sent for you if your letter hadn't come telling me that you were on your way. Sit quietly now and recall all that you can about Bob. It will save me some time and trouble in explaining if you can recollect him fairly well."

I respected his wishes and sat in silence for the rest of the drive, trying to recall what I could about Bob Jerningham.

TOM WALLACE and I had been friends after a fashion in college. We were fraternity brothers and had lived in the same house for several years and that accounted for our semi-intimacy, which is all that it really amounted to. He had a flair for mathematics, especially of the abstruse and philosophical type, while my energies had been devoted to the more concrete and practical studies of the course in mining engineering that I was pursuing. My only really close association with Tom had come in my senior year. He had worshipped at the shrine of a local goddess who heeded only the offerings of athletes and he had come to me asking for aid in developing athletic ability.

His frame was too light to offer much hope for success in football, and besides, I was captain of the track team that year, so I persuaded him to come out for distance running. He had a little latent ability and a dogged perseverance and a willingness to heed coaching, all of which enabled me to make a fair two-miler out of him. He won his letter just before my graduation and he swore eternal gratitude. His being, in a way, a protégé of mine probably accounted for the desultory correspondence we had carried on ever since. Our letters were never long but at least each knew where the other was, and when I came to return to the United States, he was the only one of my old friends whom I could locate. Fourteen years in South America will get a man pretty well out of touch with his friends in the States.

I could recall Bob Jerningham faintly, but little more than the name and a few facts remained in my memory. Bob had been a graduate student during three of my four years in college and he had not lived at the fraternity house. He had some kind of a research fellowship in mathematics and had spent his time mooning around the mathematical library and the astronomical observatory, and had only shown up at the house for supper about once a month. When he did so, his head was so far in the clouds that he showed little or no interest in our mundane affairs. I remembered that he and Tom had been rather close friends, their intimacy being no doubt due to their kindred interest in mathematics, although Jerningham, as I remembered him, went in for the practical end a little more than Wallace did.

The ride ended before an apartment building on Park Avenue and I followed Tom through the foyer and up to his rooms. I gasped a little at the magnificence of the furnishings as I entered. It was evident that he had indeed made "more money than he knew what to do with."

"Now I am ready to talk," he said as the valet took our hats and coats and disappeared with them. "What do you remember about Jerningham?"

I told him the little that I had managed to recall and he sat in silence for a few moments.

"That little won't help much," he said. "I'll have to tell you the whole thing. However, there's no hurry and I presume you would like to tell me about your mine. Fire away, I have over eight months and you don't look as if you were to die soon."

"You are getting on my nerves, Tom Wallace," I said rather sharply. "You talk as if you knew just when you were to die and how. You *don't* know any such thing and it's rather ridiculous to let your mind brood on any such obsession."

He smiled faintly.

"I will die at exactly seven minutes, four and two-fifths seconds after eleven o'clock on the morning of December 11th, 1928, in a private room in the Bellevue Hospital," he said. "I will be injured in an automobile crash at twenty-two minutes, fourteen and one-fifth seconds after nine o'clock the evening before. Both legs will be broken and my spine will be injured so badly that my recovery will be patently impossible. I

will not lose consciousness, but will suffer the agonies of the damned from the time of the accident until death literally comes to my relief."

I snorted in simulated disgust, but inwardly I was shaken. Such positiveness as to the time and place of the accident and such a wealth of detail as to the injuries was uncanny. Furthermore, there was a ring of absolute conviction in his voice.

"Have you become an oracle of Delphi, able to foretell the future?" I asked with attempted sarcasm.

"I can foretell the future," he said simply.

"How do you do it?" I asked. This time my sarcasm was real. "Do you use crystal gazing, palmistry or playing cards? Or do you use the simpler method of tea-leaves in a cup?"

He smiled again.

"I am neither crazy nor the victim of superstition," he replied. "I hold no more faith in magic than you do, but at the same time, I tell you calmly and dispassionately, that I can foretell the future."

I laughed. It was an impolite thing to do, but I couldn't help it. The whole thing was too absurd. My host, however, took no offense.

"Your laughter is simply an exhibition of ignorance," he said tonelessly. "The whole thing is purely a matter of applied mathematics. Jerningham and I worked it out, or rather, he worked it out with a little aid from me on some of the principles of pure mathematics. How did you think that I made my money?"

I professed my ignorance of his *modus operandi* and he went on.

"I made it in the stock market. Since I was able to predict with mathematical accuracy the movements of any stock, all I needed was a shoestring to start on. I ran my original capital of less than a thousand dollars up to twenty millions with only one single loss. That was caused by my carelessness in making a computation."

I WAS properly impressed by his statement. No matter how he did it, any man who was able to perform the feat that he had named was entitled to respect.

"Can you predict other things?" I asked.

"I can predict anything for which I have, or can gather, the necessary data," he replied.

"Can you tell me when I am to die?" I asked.

He started as though I had struck him.

"I can," he answered, "but I am not cruel enough to do so, unless I am sure that you realize just what you are asking."

"Why cruel?" I asked. "I really would like to know. It wouldn't worry me at all to have that information. We all have to die some time and I think that it would be an advantage to know just when."

"That is the folly of ignorance," he said bitterly. "I don't blame you though. I thought the same thing myself once. Stop to consider what you are asking for a moment. I will admit that we know that we all have to die some time, but we don't realize it. Each person looks forward with equanimity to the time when his friends or even his loved ones will die, but he can't realize the fact of his own rapidly approaching death. Death, to each of us, seems a thing apart from ourselves. We don't say so, even in our own minds, but each in his innermost consciousness fancies himself immortal and doesn't realize that the death, which he knows is inevitable for others, is also inevitable for himself. It is this thought, or rather this internal conviction of immortality that keeps us going. Think now, if you knew that you were to die in nine days, what interest would you have in life? What could you do in nine days?"

"I don't expect to die in nine days," I replied.

"You prove my point," he went on. "Thousands of people are going to die in the next nine days; why shouldn't you be one of them? There is no reason why you shouldn't, yet you refuse to even consider the possibility. Your answer is the same that would be given by every one of the thousands who are going to die, even those who are on the bed of a fatal sickness."

"If I had your ability to foretell the future, I'd live forever," I retorted. "For instance, you are going to die in Bellevue Hospital the morning of December 11th. If I were in your shoes, instead of waiting here like a sheep for the slaughter, I'd be in China on December 10th."

"I don't say that I shall die in Bellevue Hospital *if I were there,*" he said, "I said that I *shall* die there. I have checked my figures and calculations a hundred times and there is no error in them. It is the truth and there is no way to evade fate, as Jerningham found out."

"The whole proposition is a palpable absurdity," I exclaimed. "A prediction of the future can be, at best, only a shrewd guess. An accurate prediction such as you pretend to have made is an impossibility."

"It is impossible for you to take a white rabbit out of a silk hat," he answered, "but any third-rate magician can do it. It is impossible to hear music played a thousand miles away when there is no material connection, yet every schoolboy with his home-made radio set accomplishes the feat daily. The discovery that Bob and I made is merely a slight advance, a very slight advance, over commonplace everyday mathematical and mechanical knowledge, and is a discovery that may be duplicated by any man with Jerningham's brain. If no such man arises, the problem will be solved by a series of minute steps, slowly and painstakingly made, by men of less mentality. The development may take several hundred years, but it will come sooner or later. Two of the important steps in the process have already been made and are in daily use. However, I expect that I had better go back to the beginning and trace the whole development for you."

He leaned back and lighted a cigar and studied the smoke thoughtfully.

"During your last year in college, Bob Jerningham and I were pretty close friends," he began, "but it was not until the next year that we became really intimate. I was doing some rather advanced work on transcendental functions, and that brought us into contact, for some of his work tied in with mine rather closely. The longer and more intimately I knew him, the more

I appreciated the quality of his mind. He was easily the most brilliant man of this generation. Einstein is a schoolboy compared to what Jerningham was. In addition to his immense mathematical ability, he had a practical ability in a mechanical line, that was little short of genius.

"We became more intimate as the year wore on and when I graduated, he insisted that I stay at the University for at least two more years and do research work in mathematics in some problems in pure mathematics that he wanted worked out. I had about exhausted my funds, but Jerningham seemed to have plenty of money and he offered to stake me to all expenses and pay me a pretty good salary if I would work on his problems. He was good enough to say that he thought that my ability would make me worth what it cost him. In short, I stayed.

"I didn't learn a great deal about the particular problem that he was working on, but some of the things he gave me to work out were cautions. He would bring in a mass of data that he wanted collated and catalogued and curves plotted and calculated from, usually in polar coordinates, and would leave it to me to wrestle with. Sometimes it would take me three months to get the curve that he wanted. When I had it completed, he would check it over in a few minutes and would sometimes put his finger on an error that would require a month of careful checking and recalculating to rectify.

"I put in two years at this sort of mathematical hack work before he saw fit to confide to me the object of his investigations. It was nothing less than an instrument that would enable him to calculate and predict future events."

"Such an idea would have been enough to show me that he was as crazy as a coot," I interrupted.

"Yes?" said Wallace drily. "Well, it didn't show me any such a thing. It showed me merely the greatness and genius of the man. Why are you so sure that future events cannot be calculated?"

"Principally because it has never been done."

"It has been done a great many times. Have you never heard of the predicting of eclipses?"

"Eclipses are simple to predict," I retorted. "All that is necessary is to calculate the movements of certain bodies that follow definite and well-known laws. Besides they aren't done by a machine."

"EVERYTHING follows definite laws although many of them are not well-known," he replied, "and the only reason why eclipses are not predicted by machine is because there are so few of them that it would be uneconomical to make a robot to do the work. As far as mechanical calculating is concerned, you are, of course, perfectly familiar with adding machines and other forms of mechanical calculators. Why, even as long ago as when you were in college, a vastly more complicated machine than an eclipse predictor would be, was known and in common use. I refer to the harmonic analyzer."

"That is entirely different," I protested. "The harmonic analyzer doesn't predict anything, it merely takes a complex curve and breaks it up into a lot of simple harmonic curves, which, combined together, will make the original curve which was fed into it."

"Yet it is a robot that works on the reverse of the principles of Jerningham's predictograph," he answered. "You realize, of course, that when it is possible to make a machine that will analyze or break into its component parts a complex curve, it should be, and in fact is, easy to construct a machine that will reverse the process and take a number of simple curves and combine them into one complex curve. Such a machine, Jerningham made. It is on this principle that the tide predictor in the hydrographic office at Washington is built."

"What machine is that?" I asked.

"It is a robot that will accurately and positively predict the tides on any given date in any port in the world twenty years in advance," he replied. "That happens to be a relatively simple matter. There are only a few variables entering into tidal movements and their laws of variation are well known. It was very easy for Jerningham to make a machine which would take the curves representing the rate of change of these variables and combine them into a curve that would give the time and height of the tide in any port for which the data was supplied to it. There is no mystery about that machine; it is being used daily."

"That is news to me," I said.

"A machine of that type was the first and simplest machine which he constructed," Wallace went on. "His next one was on a little different mechanical principle and somewhat resembling the one announced recently by the Massachusetts Institute of Technology. You probably read about that, the papers were full of it."

"I read something about it, but I don't profess to understand it," I replied.

"It is a splendid mechanical job," he said, "but the principle is not hard to grasp. It consists of a number of variable speed electric motors, whose speed is controlled by arms attached to them ending in pointers. By moving a pointer attached to the control arm of the motor along a curve plotted out to scale, the speed of the motor is made to vary according to the value of the ordinates of the curve. If you have an operator to each curve you are using, each operator can vary the speed of one of the motors according to the ordinates of the curve before him. Thus you will have a number of motors, each running with a speed proportionate to the value of the ordinates of a different curve. It is necessary to synchronize the movements of the operators so that the abscissa value of each curve will be the same at any given moment. Do you understand?"

"That much seems simple enough," I admitted.

"Each of these motors has its separate influence on a central pointer which is extended or retracted according to the combined speed of all of the individual motors, and which, as it moves along a sheet of paper at the same abscissa speed as is being used on the primary curves, plots a curve which is the resultant of the primary curves. What I have described is the machine in its simplest operation of adding a series of simul-

taneous curves. By making slight modifications, one or more of the curves can be subtracted while the others are being added, or, by further complications, one of the curves may be made to multiply or divide the others which may in turn be adding, subtracting, multiplying or dividing one another, according to the way the robot is set. Am I making myself clear?"

"I begin to have some idea of it," I replied. "It sounds practicable."

"Practicable? It's in daily operation," he said. "That was only the second step in Jerningham's program. He had got that far by the end of my second graduate year and it was then that he suggested that we leave the University where we were rather restricted in our work and come here to New York where we could be more independent. I was interested by this time, and as he offered me the same terms that he had offered me at college—that is, my expenses and a fair salary —I came with him. We established ourselves with our apparatus in a building which he rented and went ahead with our experiments.

"By the end of another year we had constructed a machine that would handle a hundred separate variables at one time, performing any operations with any curve that we wished. One great improvement that we made was that we eliminated the need for an operator for each curve. One man could do the whole job. In addition to adding, subtracting, multiplying and dividing, the robot would extract any desired root or raise to any desired power or would apply any natural or transcendental function to them. That was the part that I worked out.

"We got the machine ready and tried it out. It worked perfectly and then Jerningham announced that we would have to quit. He had run out of money.

"THAT news was rather a body blow to me, for I had become as enthusiastic about the machine as he was. I had a little money saved from the salary which he had paid me and I put this at his service but it was too little to make a great amount of difference. While we were arguing about what we would do, I received word that an uncle of mine had died and had left me about twelve thousand dollars and I wanted to hand that over to Bob. He refused to take it at first for he knew that it was all that I had and he could see no immediate commercial value to his machine. Then it was that I got my great idea which cursed both our lives.

"I suggested that we put our robot to a practical use. Since we were both convinced by this time that everything happened according to natural laws as the product of certain variables, I suggested that we cease work on the machine itself and devote our time to determining some of the rates of change of variables that we could turn to monetary profit. The stock market suggested itself as a logical starting place.

"It took us two years to collect the data and plot the curves representing the eighty-three variables that we found affected the market on two active stocks which we selected for our first venture. When we had the data in usable shape, we ran it through the predictograph and obtained a curve which was supposed to show the variations in the price of these stocks for the next year. One of them was not so very active, so we let it go and concentrated our attention on the other one. We weren't quite broke, so we devoted the next three months to minor refinements in our calculations, meanwhile watching the ticker and checking up on our curve. It proved to be absolutely accurate and we were ready to start our financial operations."

"There is one thing that I don't understand," I broke in. "I can easily understand how you could calculate the price which your stock ought to sell at from your data, but I don't see how you managed to take account of the actions of the buyers and sellers. In other words, it seems to me that you have left human nature out of your calculations."

"We didn't leave it out. It was one of the eighty-three variables that we considered. While at that time we were unable to predict with any probability of accuracy the actions of any given individual, we had found that it was easy to predict with absolute certainty, the actions of ninety-nine per cent of humanity and that was enough to work on. The remaining one per cent didn't affect the market enough to vitiate our curve. I'll describe later some of the troubles we encountered when we attacked the problem of the lone individual. But to get on with my story.

"By the time that we were ready to start speculating, although with our knowledge it wasn't really a speculation, we had less than a thousand dollars left. We talked the matter over and decided to make a lot right away or go broke, so we dug up a broker who would let us stretch our margin out pretty thin and we piled our whole lot on our chosen stock and sat back and waited for things to happen. They happened all right, exactly as our curve predicted and we made money fast. As the stock rose, we pyramided. When it was due for a small setback, we would sell enough to get our margin on a firm basis and ride the depression out. When a big retrogession was due, we would sell out and then sell short and whipsaw the market going and coming. We kept this up for several months and then took our profits which amounted to about two hundred thousand dollars and went back to our work.

"We didn't want ever to be financially embarrassed again, so our first task was to determine and calculate the variable on a bunch of selected stocks which would give us wider latitude for our operations. We discarded the less active ones, but we accumulated data on thirty and went back to the market. It was a sure thing. We cleaned up over twenty millions and then quit for good. One thing happened that alarmed us for a short time. Twenty-nine of our stocks behaved according to specifications, but one didn't. However, when we checked back, we ascertained the cause. It was due to my carelessness in misplacing a decimal in calculating one of the primary curves and not to any fault of the machine."

"Didn't the war interfere with your work?"

"No. We tried to enlist in the army early in the game, but they wouldn't have either of us. Bob had poor eyesight and I turned out to have flat feet, so

we were both exempted. We tried for a while to fit into other work than fighting, but there were a dozen applicants for every white collar job and we couldn't see where it would help materially to win the war, if we put on overalls and kept a good mechanic out of a job, so we stuck at our work.

"The war turned every one's thoughts toward the uncertainty of human life, and Bob conceived the idea of determining the variables that went to make up a human's life span. That was where we ran into the variable of human nature in the individual but Bob finally solved the problem. I won't bother to go into details, but by testing the reaction to certain definite stimuli, the temperament of an individual can be determined with great exactness. It was not an easy problem and it took eight years of research and calculation and we made a good many errors at first, but in the end we were able to classify people on the basis of a series of 'temperamental index readings,' as we called them."

"How many variables did you find?" I asked.

"Nine hundred and thirty-four," he replied.

"It must have taken *some* machine to handle them all at once," I exclaimed.

"The machine would have covered an acre of ground if we had been forced to combine them all in one calculation," he said, "but as it happened, we didn't have to. We found that they were divided up into groups which interacted upon and affected one another. The number in a group ran from twelve to ninety-one and there were twenty-two groups. Our method was to obtain a resultant curve for each group and then a grand resultant from the twenty-two. When the final curve ran to zero, we believed that it represented the end of the life span of the individual.

"WHEN we had perfected our method, as we thought, we had to find some way of testing the accuracy of it. There was a murder trial going on in the state at the time and we obtained permission from the Governor to make some tests on the accused. They thought we were trying to establish his sanity and we let the authorities think so, but we were really trying to tell when he would die. When we got the curve finished, it showed his early death. We watched the trial pretty closely and when he was acquitted, we felt pretty sick. However, less than two weeks later he was shot to death, presumably by some gangster, and as near as we could determine, we had hit the time of his death to the fraction of a second.

"That encouraged us, but we wanted more cases. We obtained them through the courtesy of a hospital who allowed us to take readings on certain of their patients, with the patient's consent, of course. We made twenty calculations and in every case where our prediction showed an early death, it happened on scheduled time. Two of our test cases are living yet and according to our curves have a good many years of life ahead of them.

"Now I must digress a little in order that you may understand the rest of the story.

"When we first came to New York we had acquired, along with the rest of our office furnishings, a stenographer. I don't remember her name, but it doesn't matter for she left soon and another took her place. We changed a number of times, usually getting a worse one than the one we lost, but the worst that we ever got, was the one we took on just before we had completed our string of calculations. Her name was Mabel Thompson and she was as good looking as home made sin, but that is all I can say for her. I took her out to supper a couple of times, but as soon as I found that she had blond hair inside her skull instead of brains, the blond hair on the outside of it lost its attractiveness and I dropped her. I had to, anyway, the competition was too hot.

"I suppose that it was the attraction of opposites that was the cause, for she was just as brainless as Bob was brainy. Whatever the reason, he fell hard, and while I don't think she cared for him particularly, she had a bad case on his bank roll and she hooked him nicely. Bob began to think about her instead of his work and I urged him to go ahead and marry her. I figured that a month of Mabel would cure him, and she could get the divorce and alimony that I was sure figured in her plans, and Bob could get to work with a clear head again.

"They became engaged all right and she promptly planned a year-long trip around the world for a honeymoon. That rather worried Bob, for he had conceived a greater idea than any he had had before, and he didn't relish losing a year, even for Mabel. She was anxious to marry him and start spending his roll, but she was foxy enough to pretend great and absorbing interest in his work and she hung around the office all the time—in order to keep an eye on her successor, I fancied."

"I thought you said that she was working for you," I remarked.

"She was, but when she and Bob became engaged, I suggested that it would be a good idea to discharge her with two years' salary in order to let her get ready for the wedding. Bob agreed and we got a girl who didn't spell principle with an 'al'.

"She was more or less in the way in the laboratory and to quiet her and keep her away from Bob, I took a lot of temperamental index readings on her and gathered other data that would enable me to predict her life span, although at that time, I had no idea of doing it.

"The great idea that Bob was working on was a method of calculating not only the time, but also the place and manner of an individual's death. That introduced a lot of extra complications and variables and for a while threatened to stump us, but Bob had made up his mind to postpone his wedding until he solved the problem and he worked like a demon and drove me as if I were a slave. His genius became even more scintillating under the stimulus of his affair with Mabel and he solved the problem. One day he made the final calculation and we looked on a system of curves that would enable us, given the data, to predict not only the time, but also the place and manner of the death of any individual on whom we could secure sufficient facts. Of

course, it wasn't confined to the death of a person, although that was the most important event. By supplying data, we could predict any event that would happen.

"For some time we checked our method by experimenting on one another in minor affairs. For instance, Bob would determine what color tie I would wear the next day, or I would predict what he would have for dinner the next night, and little things like that. When the event had happened we would compare notes and we never found ourselves in an error.

"WHEN we had checked our method to our satisfaction, on one momentous day, we assembled all of the needed data and ran a determination of my future life and the time and circumstances of my death. It was on that day that I found when and where I would 'go west.' It was something of a shock to see my death predicted so soon, but I thought of the same thing that you suggested, namely, that on the day I was due to die in New York, I would be in China or somewhere else. It really didn't worry me much at first.

"After we had finished calculating my demise, we ran a curve on Bob and then we got a real shock. Bob was due to die in just thirty-nine days. He was to die in a railroad accident near Lima, Ohio. He looked at me with a funny expression when he read the curve and the same idea that had struck me struck him.

" 'When that time comes, I'll be a good many miles from Ohio,' he said with a laugh.

"I agreed with him as to the wisdom of that and we began to make plans. We decided that the best bet for him would be to take a train for San Francisco the next evening and sail from there to Hawaii. As he pointed out, he could get to San Francisco in four days and he would be safe in Honolulu long before the day came when he was due to die in Ohio. We both laughed at the way in which we were going to cheat fate.

"When we had perfected the plans, it struck Bob that it would be a fine idea to marry Mabel the next morning and start his honeymoon. It sounded all right, but I suggested that we run through the data that I had gathered on her and see how her curve looked. He agreed and we assembled the data, plotted our curves and ran a resultant. It showed that Mabel had only seventeen days to live and that she would die of poisoning *in Honolulu.*

"We both of us looked rather funny when we saw that.

" 'Apparently, that idea won't work,' said Bob with a sickly grin. 'If I stay around here, something is liable to take me to Ohio and if I go to Hawaii and take Mabel with me, I am sealing her death warrant.'

" 'The best thing for you to do,' I told him, 'is to write Mabel a letter and tell her what you have learned and warn her not to leave New York for a while. In the meantime, you go to Hawaii where you are safe. Mabel can join you as soon as her seventeen days are up; in fact she can start from here in ten days if she wants to, and you can be married there. After your honeymoon you can come back and we can go on with our work. Meanwhile, I'll keep things moving to the best of my ability."

"Bob agreed with my plan and so far as I knew, he carried it out. He gave me a letter to mail to Mabel and he took the flyer the next night for Chicago on his way west. I mailed the letter after seeing him off and went back to work, expecting that the next word that I received from Bob would be that he had sailed. You can imagine my astonishment when I received, late the next night, a wire from Chicago telling that Bob was in the Presbyterian Hospital there. The wire said that he was unconscious, but he had been recognized by papers in his pockets and the papers indicated that I was the logical one to be notified.

"I went to the telephone and called Mabel, for I thought that she ought to know about it and I was sure that she would want to go to Chicago with me. Mabel had gone. I asked where, and when I was told, I nearly fainted. She had left on the flyer that evening for Chicago, *en route to Honolulu.* I couldn't get any satisfaction out of her landlady except that her 'boy friend had sent her a ticket and told her to come.' I began to wonder if we were really as smart as we thought we were about beating fate. I called up the airport and was lucky enough to get a place on the mailplane to Chicago the next day.

"When I got there, I found that Bob was still unconscious. He had had a four-hour lay-over in Chicago and he had apparently taken a taxi in order to kill time. The taxi had been smashed up at the corner of Madison and State streets and Bob had been rushed to the hospital unconscious and had remained so.

"There was nothing that I could do for him and I did just that. All that I could do was to look up Honolulu boats and figure out which one Mabel would take. I thought she would take the first one, so I wired her in care of it and told her what had happened to Bob and told her to read his last letter and be guided by the advice he had given her in it about staying in New York for a while. Later on I would have given a good deal to have recalled that wire.

"In due time I received an answer from her. Mabel proved herself to be just as dumb as I thought she was. She wired back something to the effect that she knew that I would like to break up her match with Bob, but that she knew that Bob was in Honolulu and that she was going there and that she wasn't fooled at all by my wire. I saw then that there was no use in trying to stop her, especially as she had waited and sent the wire just before the boat was due to sail.

"BOB didn't recover consciousness for a week and when he did he was too weak to stand a shock, so I didn't tell about Mabel. He asked for her, but I told him that I had thought it better not to alarm her, and I allowed him to think that she was safe in New York.

"He gained strength very slowly. As the day for Mabel's death approached, he got pretty nervous, but when the day passed off without anything happening, he looked relieved and the next day he was quite cheerful again.

"'I guess we cheated fate all right, Tom,' he said. 'There is really no reason why Mabel shouldn't come to Chicago and I'd like to see her. Wire her to come, won't you?'

"I stalled him off and he appeared satisfied. It never occurred to me to censor or even look at the daily paper before he saw it and as it happened, there wasn't a thing in the one I saw. The nurse brought him a different one and there, on the front page, was a headlined account of Mabel's death. She had talked a good deal on the voyage and the reporters had got hold of the romantic angle of the affair and her death by ptomaine poisoning was news therefore. The hour and minute of her death corresponded exactly with the time we had predicted when allowance was made for the difference in time between Honolulu and New York.

"The shock threw Bob into a relapse and he was unconscious for another two days. When he recovered his senses, the police were after him."

"The police?" I asked in astonishment.

"They were indeed," said Tom. "The Honolulu police investigated her death and looked through her effects and among other things they found Bob's letter telling her that she would die of poisoning on that date unless she obeyed his instructions. He hadn't told her where she was to die, but he told her that he was leaving for Honolulu and told her to follow him in ten days after he left. He had enclosed a check for her expenses. Whether the girl misunderstood him or whether she paid no attention to the part of the letter telling her when to come, no one will ever know, but the facts were that she had hustled off to Honolulu on the fastest trains and boats that she could connect with.

"The police found Bob's letter and also the wire that I had sent her at San Francisco and they had wired Washington of their suspicions and asked that Federal warrants be issued for both of us. The Department of Justice soon located us and the warrants were forwarded to Chicago and we were both arrested.

"Fortunately my wire had been so worded that there was really nothing to hold me on, except possibly as a material witness and I was admitted to bail and was able to go back to the hospital and keep an eye on Bob.

"He recovered slowly and I wished that he would recover even more slowly for he was pronounced fit for travel too soon to suit me. I figured that he was safe there in the hospital and I would have kept him there longer. The day that the surgeon said he could be discharged was two days before we had figured out that he would die in Ohio. Hawaii being a territory, he had been arrested on a Federal warrant and no extradition proceedings were necessary. The Department of Justice men told us that we would both be taken to Washington for a preliminary hearing before being sent to Hawaii for trial. We didn't learn of this plan to take him east until the day that he was pronounced fit to travel.

"I was still free on bail and you can bet your life that I allowed no grass to grow under my feet. I got the best legal talent in Chicago to handle the local end and I wired to New York and got the best legal talent there on the job. I told the New York men to go to Washington and get busy. The orders that I gave to all the lawyers were that no matter what else happened or what it cost, they were to keep Bob from being taken east for seventy-two hours. After that time had passed, nothing would matter.

"The lawyers did their best. The first order that came from Washington was to the effect that Bob was to be taken at once, but just before train time another wire came, ordering a delay of seventy-two hours. When we saw the second wire, we shook hands and told each other that we had won the battle.

"So we had for a time, but the next morning another message came from the Attorney-General's office stating that the delay had been rescinded and that he was to be brought at once. I asked what train we were to take and sure enough, it was one that would put him into Lima just on time to meet the wreck that we had predicted.

"Our Chicago lawyers tried to do something, but they didn't accomplish anything except to run up huge bills. The train that was chosen was a poor one and as a last resource, I offered to pay the extra fare for Bob and both his guards if they would take another train that left Chicago three hours earlier and which passed through Lima over four hours before the accident was due to happen. The choice of the train was more or less a matter of choice for the Department of Justice operators who were to guard him, and when I bribed them to the extent of offering to provide a drawing room and free meals for all concerned, they agreed that it would be no dereliction of duty on their part to take an earlier train.

"We took the earlier train and everything went well until we left Fort Wayne, Indiana. We were rolling along on schedule time and again we were congratulating ourselves on having won out. About five miles out of Fort Wayne, our train came to a grinding stop. We stood for some time and when the conductor came through I asked him the trouble.

"'Burned out bearing in our engine,' he said. 'We have sent for another one and we'll be on our way soon.'

"'How long will we be delayed?' I asked.

"'Not over three hours,' he told me.

"Bob looked at me with a funny smile. There was nothing that I could say.

"THE three hours passed and then some. It was nearly four hours before a relief engine was hooked on and we started. We were still a little ahead of the accident time, but it was soon evident that the relief engine was not as powerful as the big one usually used on the limited and that we were losing time. Bob looked at his watch as we neared Lima.

"'I guess I have about twelve minutes left,' he said with a sort of a sick grin.

"I tried to laugh him out of that mood, but I had no luck. In point of fact, I had begun to think that he was right. Suddenly an idea struck him.

"'I've got time enough to make my will,' he said. 'Give me a pen and some paper.'

"I handed him my pen and he proceeded to write out a will in which he left everything he had in the world to me. The Department of Justice men were willing to humor him and they signed as witnesses. When the witnessing was completed, Bob handed the will to me.

" 'Good-bye, old man,' he said. 'You will survive the wreck all right you know, and this will fixes it up so that you get what plunder we have gathered. Don't worry about me. Since Mabel has gone, I can't say that death has any very great terrors for me.'

"He turned and looked out of the window. I had a pretty big lump in my throat and I felt like hitting the detectives who took the whole matter as a huge joke. We swung around a curve.

" 'This must be about the time and place,' said Bob as he looked at his watch. 'I hope that none of the rest of you—'

"We were suddenly thrown forward and our brakes squealed. I tried to recover my balance and then came a terrific crash as our train ran head-on into a freight that should have been sidetracked. I recovered consciousness two hours later in a hospital in Lima. My first question was about Bob. He had been taken from the wreck dead."

Tom's voice died away and I sat for a moment in silence.

"A curious tale," I said at length. "It was a funny coincidence."

"Mabel's death might have been a coincidence," he replied, "and I was tempted at first to think so, but Bob's wasn't. I am firmly convinced that neither of them can be explained by that method. It was merely that our predictograph told the truth. That is why I told you that I have little interest in life because I have no future."

"You said that you would have sent for me, if you hadn't received my letter saying that I was on my way to New York," I reminded him. "Why?"

"For this reason," he said. "As I told you, I have less than a year of life left and no one knows anything about the predictograph. I am a lone wolf and have no one dependent on me. I will leave my entire fortune, which is over twenty millions, to you on one condition."

"And that is?" I asked.

"On the condition that you will let me teach you how to operate the machine and that you will let me figure your life span for you."

"What if I refuse to take it on those terms?"

"In that case, I am going to destroy it."

I thought rapidly for a moment. The prospect was certainly alluring. Riches beyond even my dreams, would be mine and with them, almost endless power. I could tell in a moment whether the merger we were working on would go through, and that piece of information alone would enable me to make another fortune in the stock market. I could find out just how happy and successful I was going to be and that knowledge of future success might help to tide me over some periods of hard going. On the other hand, suppose it predicted failure and misery instead! Since its predictions could not be evaded, would not that foreknowledge sour my whole life?

Next I thought of Rose. I was going to ask her a very important question when I returned to Peru if the merger went through. I could know her answer in advance and would also know just how long we would each live— Here the thought of Bob's experience intruded itself. I gave a searching look at Tom Wallace's face and made up my mind.

"No, Tom," I said rising, "I don't believe that I want it. You had better destroy it."

"I'm sorry," he said in his toneless voice as he rose.

"Why?" I asked, slightly surprised.

"It would have given me a fresh hope of life if you had accepted," he replied. "The predictograph told me that you would refuse."

THE END

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The SPACE HERMIT

By E. Edsel Newton

Salls Tells a Fantastic Story

I SAT near the main hangar on Poppy Field, five miles from San Bernardino, when Salls came in. He made a perfect three point landing and sprang from his plane with youthful agility and ran straight to me. There was an anxious look in his eagle eyes. He turned with intent glances to the sky from which he had flown.

"Something wrong?" I asked. He shook his head like a mad bull. He shaded his eyes with his hand then rubbed them furiously. His big body was shaking like a leaf.

"Yes, Hell's broke loose," he said dramatically, and again he turned and looked into the northern sky. I arose and stood beside him.

"Claxon!" I asked. "Cracked up?"

He breathed furiously. "Yes—smashed, and ten thousand feet up."

I stepped back and stared at him and studied him long and hard before I could speak.

"You don't mean he smashed in the air—collision?"

Salls was nervously upset. He did not answer immediately.

"Come into the office, Metters, and close the door," he said. "And be sure and keep this under your hat for the present."

We went inside. He sat across the desk from me, still shaking his head as if some fantastic, unbelievable scene had come before his eyes. Apparently he had suffered a great shock, but I could not bear his silence.

"Good God, Man, tell me!" I pleaded.

"Hardly know where to begin," he said between breaths. "Any way, Metters, a flying man expects the air to be clean of—of physical obstructions, does he not?"

"Sure," I said. "But what—"

He ignored me after that. It seemed that he was absorbed in a nightmare and talking in a fitful sleep.

"Claxon and I were at eleven thousand feet when my motor spat. I gave up the climb and leveled off. He followed me—he was always a good student—and I thought it would be funny to drop a barrel and see if he did the same, and again leveled off a few hundred yards to the east. I climbed again, and he followed. Again at ten thousand we leveled off and started at full throttle back to the field when I saw a curious object before us. I don't believe he saw it. It seemed like a sort of dirigible car made of glass and there was a man standing inside it and staring at us. That's all I saw of him when Claxon smashed the Waco right into the thing."

I gasped. I could not doubt Salls.

"I circled and started back to get a good view of whatever it was up there. I got only a glimpse of it before it disappeared like a bullet into the sky above. It looked like a huge glass fish turned on its side with a cabin suspended underneath, and it was transparent and I could see inside the thing. Shades were drawn in the after part of the cabin." He stopped abruptly. "Perhaps I shouldn't discuss this with you, Metters," he said. "I know you won't give it much credit—no one could be expected to. I hardly believe it myself."

"But you've got to report to the commission about the accident," I reminded him. "Where did the Waco crash to the ground?"

"Didn't see it after the crash. I suppose it's about ten miles north of here in the hills—if it came down."

"You doubt that it did?"

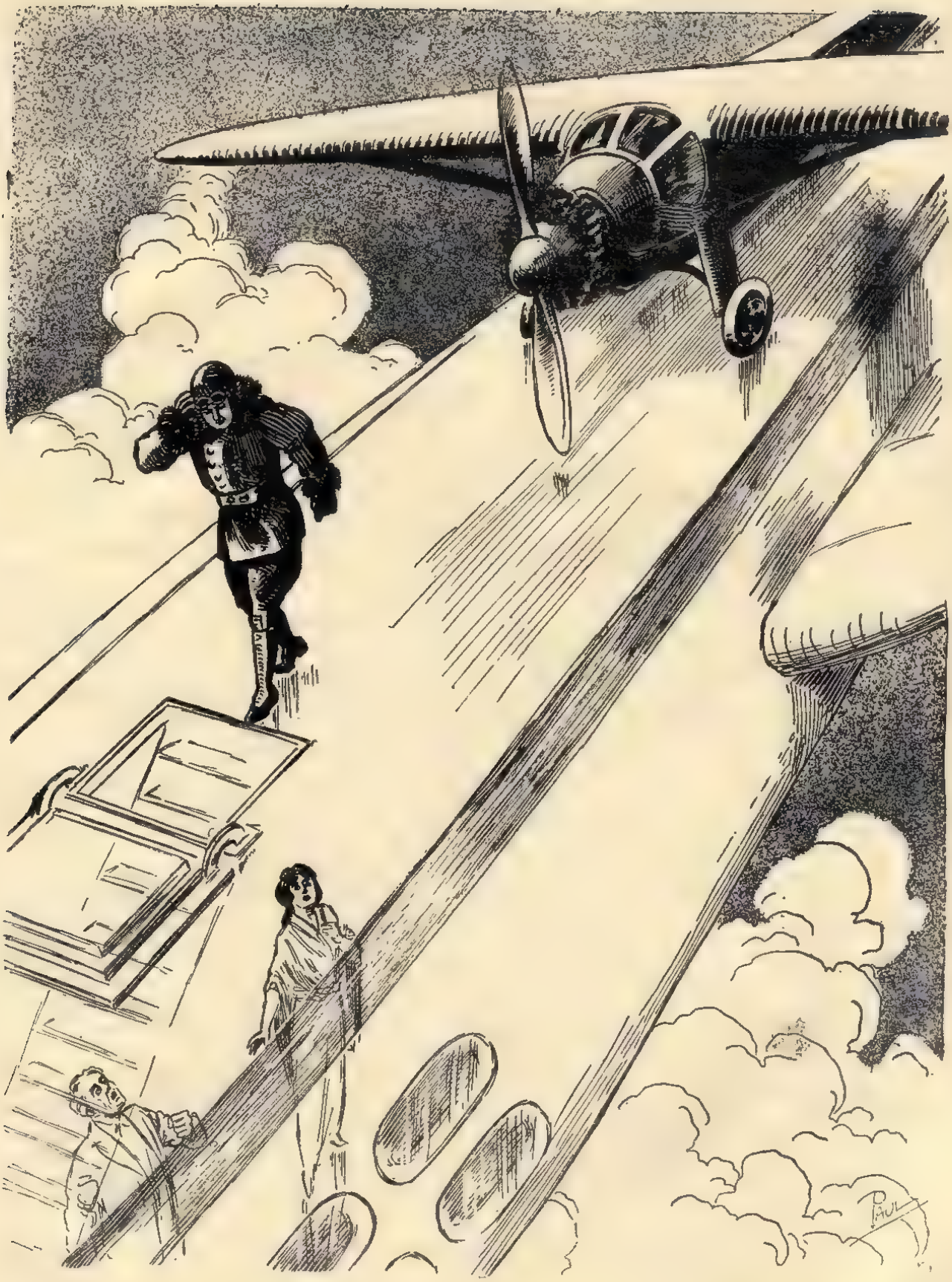
"I don't know," he sighed, still looking at the sky through the window. "Whatever happens, don't repeat this. The thing will be settled somehow. If the International had a supercharger I'd find that phantom and—but it's hopeless. I can't believe it, even after seeing it myself." He arose and faced me. "Tell me, am I really alive and talking to you, or is it a dream?"

"It must be real," I assured him. "I think you'd better catch some sleep, Salls, and I'll get into the Jenny and try to find Claxon. Possibly he is alive."

"Don't expect to find him alive," he moaned. "He was the best student I ever had, but he isn't alive. They tried to sell him a parachute with the Waco and he laughed in their faces. The poor devil! He never expected that."

AVIATION seems to have gripped the imagination of the more enterprising populace, just as radio did a few years ago. It's a tremendous field and will in all likelihood exceed anything we can picture even in our wildest flights of fancy. "The Space Hermit" may seem fantastic, but it is hardly implausible and suggests a number of interesting new scientific theories about the outer air that are ingenious, to say the least. It is an absorbing tale, cleverly written, and furnishes much food for thought—and perhaps for experimentation.

THIS is an age in which few things are doubted. We credit science with the power of creating what we dream about. Confused as I was, I could not doubt Salls. I liked him immensely, though neither of us had a single material incentive for our binding friendship. I was on his field merely from choice. I had cruised in from Fort Worth a month before. I had bided my time wondering what to do with myself next. He had been thoroughly unselfish with me. Every facility for repairing my ship was at my disposal. In return I had hopped a few passengers for him on crowded Sundays. We often flew to Los Angeles in my plane, going down



I saw that I had landed on the top of the phantom. I left the motor running at twelve hundred and climbed nervously out on top. My eyes fell upon a ladder that presumably led down into the cabin and with light steps, I walked toward it.

in the evening and returning after midnight. His great love was training young men to fly. Until then he had never lost a student. He is still training them, but there is little heart in his effort. His record is broken, and he has for an excuse only a most fantastic story. I am going to back up his story, whether or not the commission chooses to believe what I relate. I feel that I must talk of it, if only for my own sake.

A three-day search revealed Claxon's Waco piled up on a mesa in the hills near San Bernardino. It was crushed beyond recognition, and, still strapped in as he was when came out of the barrel, was Claxon's broken body. An ambulance hauled the remains back to the city where the broken-hearted and bewildered Salls assisted in the funeral arrangements.

The next morning I ordered a supercharger from Los Angeles, which came by plane three hours later. By nightfall I had installed the apparatus on my ship. The next day I consoled Salls as best I could and took off. I cruised all morning and set down at San Diego for oil and gas. That afternoon I climbed to eighteen thousand feet and leveled off. Nothing was in sight. I flew until twilight before I set down again at Poppy Field. Salls came out to meet me as I taxied up to the hangar. He wished to go with me the next day. He could not rest for thinking of the phantom.

We searched the sky of California for three weeks. At last we gave it up and shook our heads in despair. For all we knew, the phantom might have been near us a hundred times, because, as Salls had explained, it was transparent and could hardly be detected in the sky.

Weeks passed before I began to think seriously of the incident. I had tried to attribute Salls' story to mirages. I tried to invent a thousand excuses for his having such a vision. I attributed it to shell shock in the war, optical illusions, or the fact that he was hiding the real facts of Claxon's crash. I left San Bernardino early in April and went to Seattle. The weather was rougher than I expected, so I packed up and started for Los Angeles.

The Phantom Ship

AFTER the incident at Poppy Field I always flew at a high altitude. I was flying a Hamilton with extra long wings and slow landing speed, but the ship was capable of one hundred and fifty miles per hour under full load. When I left Seattle I shipped my baggage to Los Angeles by express and in its place I filled my fuel tanks to capacity. I had decided to make the southern city in one hop.

I climbed to thirteen thousand feet before I leveled off to look down upon a storm torn array of forests which was rapidly being obscured by thick, black clouds that seemed to come from every direction.

I was thankful to Allah that I had chosen the upper course, for the flying was smooth and I was comfortable. I had that feeling of independence which is doubly wonderful to the aviator. I could turn wherever I pleased and stay as long as I wished.

I crossed the California-Oregon line at nine thousand feet. It was three o'clock in the afternoon and the sun was shining only in spots. I climbed to nineteen thousand feet before leveling off. Then I sat back to watch the supercharger do its work.

My ceiling was as clear as a crystal. Rifts of clouds obscured my view of the earth. I had Dunsmuir in mind. I thought of getting my bearings there by the Hotel Travelers, which I knew to face directly south. But I was afraid of the mountains. So I climbed again and approximated my position by my speed and wind allowance and the drift indicator. When I leveled off I was shivering from cold. The altimeter showed twenty-seven thousand feet. In trying to divert my mind from the penetrating cold up there, I finally thought of Salls.

FOR weeks I had been trying to attribute his story to a mirage or a reflection in the glass enclosure of his big International. But I could not forget the fact that Claxon had really crashed the Waco. I did not wish to be so unfaithful as to believe Salls had fabricated the story. Suddenly I was conscious of something a few hundred yards forward and below me. I turned to look at it. It was the most amazing sight I ever saw or expect to see.

It was a great transparent object the length of an ocean going steamer. When I say transparent I mean that it was as clear as glass, so clear that it did not reflect the sun that shone upon it. It was shaped like a dirigible, but it was not the conventional type of airship. It was oval (fitting Salls' description of the object he had encountered), like a great fish turned on its side. On its bottom, which I could see because of its transparency, was a cabin, perhaps seventy feet in length, in which I could see two people.

I WAS astounded, to say the least. I could not believe the giant ship was an instrument of man. It seemed like a fantastic object from another planet; perhaps from Mars. But I knew that to be impossible. I swung closer and cut my motor to the idling point and hovered above, thinking that I would pass onward and be compelled to turn in order to get another view of it. But I discovered that it was moving about the same speed as my own ship. I noticed that the two people were a man and a woman. Suddenly the man looked up, up through perhaps forty feet of whatever his ship was built of, and stared at me frantically. His hand shot out to an object which I took to be a switch. The great ship started gathering speed. I did not wish to lose an opportunity for a great adventure. My wheels were almost rolling on his upper surface. When I saw that the nose of his ship was farther ahead than it was before I had dropped over him, I dipped and felt my wheels touch something hard. I shoved the stick forward and placed it in a becket. Then I opened the window. Peering out, I saw that I had landed on the top of the phantom. I left the motor running at twelve hundred and climbed nervously out on top. My eyes fell upon a ladder that presumably led down into the cabin. I walked with light steps to it, grasped the support and looked down. The bottom of the ladder was in a room in the long cabin, which by this time I could see was filled with different objects, most of which

were made of the transparent material which formed the ship. The man watched me closely as I started to climb down. When I had reached safety below the surface of what I supposed was the gas bag, his hand shot back to the switch. The great ship gave a lurch and rolled quickly over. Before I realized what had happened I saw my Hamilton slide from its landing place and flutter and spin on its way to the earth.

I suddenly felt my shoulders, thinking of my parachute. I had left it in the cabin of my plane. I was alone with two people whom I had never seen. They might be two remarkable people; they again might be two maniacs. I decided to face the adventure in good spirits and climbed on down the ladder until I felt my feet touch something solid. I looked about for the people I had seen. The woman had disappeared, but the man stood there facing me.

HE was about forty years old. His face was clean shaven and his features were nobly formed. His hair was long about the temples and gray as if it had suddenly turned so. He was six feet tall and well proportioned. His mouth was firm, and his deep blue eyes seemed to pierce my very soul. I tried to speak. Finally I managed to say something in the way of an apology.

"I am sorry to have intruded, Sir."

He drew a deep breath, still looking at me as if I were a child and helpless in his hands.

"I too am sorry, my friend, that I was compelled to destroy your airplane," he answered, "but it was quite necessary. Please follow me." He led the way into a cabin and pointed to a transparent chair. A table, three feet wide and six in length stood between us. On it were teacups of glass and a plate of some mealy, white and yellow substance, which I supposed was food.

"You may refresh yourself," he said politely. "For the time I am engaged." He bowed and hurried into the next room. I felt a sudden lurch of the ship as if she were gathering way. I looked below me at the earth. It was receding farther and farther away. We were going at a terrific speed. Then, when my host finished his arrangements, he came into the cabin, pulled a lever above his head, and sat down to watch me.

"You have not tasted the food?" he suggested.

Whereupon I tried to smile and reluctantly tasted the dish. It had a peculiar taste as if it were blended from several foods. I consumed the contents of the dish with evident enjoyment, even under the strain of evident careful scrutiny by my host. I drank from the cup, but it was not tea that I drank. When the simple meal was finished, I lighted a cigaret and took several quick puffs while he watched me, seemingly amused. That was the cue to my attempt at conversation. He declined my offer of a smoke, settled himself in his chair and waited.

"I do not know where to begin, Captain," I said. "Though this is an intrusion, I am curious to know about you and this strange craft. Must I attribute this discovery to your genius?"

"IT is mine," he said proudly. "I built it. It is perfect. You had better remove your flying suit, as the temperature is adjusted here." He pointed at the instrument board upon which were a number of switches, levers and dials. I noted the thin linen suit he wore and proceeded to take off my own heavy clothing. Strangely enough, I was thinking of the woman, who was now concealed behind a drawn shade in the forward end of the cabin.

Finally my host asked thoughtfully, "What is happening on earth? Is there a new president of your country?"

I was amazed, but I answered him with studied nonchalance, "The same one—another term," I said.

"I thought as much," was his only comment.

"I mean the silent one," I explained.

He nodded as if he understood.

"I would like to know something of your life here, Captain," I urged. "This is all so very strange to me that it is fantastic." I indicated the craft in general.

"By what right do you ask to know of my life?" asked the Captain. "You have no right to be aboard my ship."

"My apology, Captain," I answered sheepishly. "At least I cannot leave unless you wish to see me die a horrible death. I lost a friend by your ship."

He looked off through the wall of the cabin into the western sky. A great sadness seemed to come over him. "I wish death to no one," he said. He arose and paced the floor for several minutes. Then he turned to me and said firmly, "You shall never leave this ship, sir. It will be well for you to resign yourself to your fate—particularly since it will not be uncomfortable after all."

"You choose to keep me aboard, even against my will!" I demanded.

"You came of your own accord," he said calmly, looking me squarely in the eyes. "I cannot release you. I have my own reasons for that. However, you shall be comfortable at all times, if you give me your word of honor that you will never try to bring my craft to earth."

"And if I do not give you my word of honor?"

"If you do not—if you dare violate the hospitality you have forced me to bestow upon you—I shall overcome you and force you to abide by my wishes."

I was in a perplexing position.

"In that case, I promise you I shall never interfere with your plans," I said, a little relieved.

He extended his hand and I took it.

"Thank you, Mr. Metters," he said radiantly. "Now I shall proceed to explain all this to you."

We both sat down. When he had reclined in his chair, he began:

"Perhaps you remember some years ago—three, to be exact—when news came of the disappearance of Martin Hedron, the scientist. Whether you remember that or not you will recall that a great explosion rocked the countryside in southern Missouri about that time?"

"I recall both," I said.

"I am Hedron. Now, in order to grasp my explanation of how this ship came to be built, you must attend

to every detail. Otherwise you would find cause to doubt me. Do you realize that we have not been on the earth for three years?"

His words astounded me. I wanted to ask about the woman I had seen, but decided to bide my time.

"It is hardly believable, Captain Hedron," I said. He smiled and continued his story.

Martin Hedron's Story

SETTLING back again, his strange voice came in a swift staccato.

"Nothing is of so very much importance, Metters. You may think it strange that I have that philosophy and still accomplish what to you seems fantastic, great—impossible. I myself look upon these things I have invented as mere playthings. That is why I have renounced the world. I care not for the material possessions for which you struggle. I want only peace and silence. Why, I look down there now and see the changes and growth in your cities, the long lines of concrete pavement that stretch across your nation, the steamships and airplanes at which you marvel, and I do not care to know of them. I remain as far from your turbid world as possible. I hope I shall never be obliged to communicate with the earth again, which is to say that I shall be buried in the air. Do not marvel at that. Neither should you marvel at this airship.

"This ship is five hundred feet in length, eighty feet wide amidships, and is perhaps forty-five feet high, which includes the cabin. It is built of transparent steel, the discovery of which I made while experimenting with machinery for taking substance from the air. I had already discovered the means of taking palatable food and water from the air, not to mention the salt and all other requirements of the human body. In the discovery of the metal of which this ship is built, I found that it was as hard and tough as steel, and lighter than aluminum. I therefore built my electro-magnetic motors of this material. They, too, are transparent, save for the parts of copper and iron which constitute the electro-magnets. The gas bag is built of the same material, with many girders running crosswise and lengthwise of the bag. It is filled with helium, which I have also succeeded in taking from the air. I have a machine for the purpose of making each. Therefore, when your friend crashed into me near the Mohave desert and broke a dangerous hole in the forward end of the bag, I gained altitude as quickly as possible. I made the necessary amount of what you may call transparent aluminum and the necessary repair. I found that the gas in that particular cell was slightly heavier than the other from the onrush of air when the plane struck. So I turned to my faithful machine for extracting helium from the air, and I filled it. I tell you I can do anything with air.

"Perhaps you wonder why I choose to keep my work a secret. It is not from choice. If I should give my secret to the world I should never find peace. As it is, I can rest here above the clouds, assured that no one knows or cares where I am, and this solitude is what I most desire. The woman you saw a moment ago is my daughter. I have often wondered if she came with me only because she loves me. But at times I know that she is far, far happier than she would be on earth among the jealousy, hatred, dishonesty and heartlessness of the people.

"Four years ago I finally succeeded in inventing all these machines. I took my daughter with me, and hid in a valley in Missouri. Summer came with the proper density of air to assist my metal-making machine, and I went to work. After six months' labor I succeeded in finishing the bag structure. Then I built the cabin beneath and installed all these machines. The motors of this craft are forward, in the nose. They are silent. There are ten of them, but they drive a single propeller, which is thirty feet in diameter. The electricity necessary for operating the motors is generated by auxiliary propellers and a dynamo, which supply exceeds the demands. I have perpetual motion, if I desire. I can cruise at ten miles an hour or two hundred. I have the bag so constructed that it resists wind pressure. It is the strongest ship in the air.

"BUT after having started the building of my ship, I found that I had many curious visitors about. I was at a loss as to what to tell them. I finally decided to say that I was experimenting, and that should anything in the way of an explosion occur, they must not be surprised, and that instruction for the disposal of my belongings in such a case were unnecessary, as I had no friends or relatives who would be interested. These people accepted my alarm with fear and dread. I never saw a single person after that.

"My daughter was the little soldier always. She worked with me, helped me build this craft in its entirety. It is named for her, the "Glorie." I shall speak more of her later. Suffice to say that you must never speak to her nor must you ever come nearer her than you are now. She has finally caught the spell of the silence of the sky, and she is happy.

"But let me go back to my story. When we finally succeeded in completing this ship, which may seem unbelievable to you, we were at a loss to know how we should escape from the earth unseen. I recalled having told the people of a possible impending explosion. So on the night of our take-off I arranged a huge charge of nitroglycerin in the scraps of material which were left. I set a long fuse and fired it. We simply got into the cabin and took control, cast off the moorings and disappeared into the sky. Perhaps the natives down there in that country think I was a maniac. I do not know what was reported—"

"The papers told of an eccentric building—a long glass house, it was described by the natives," I cut in. "They related a story of being warned, and of being awakened one night by the explosion which supposedly destroyed you and your structure."

He smiled as if he were greatly pleased at this.

"We have never touched earth since. We have cruised over the entire surface of the globe. Since the accident which killed your friend we have been across the Pacific and on to Russia. I do not really know my bearings now—and I don't care. I can go to sleep to-night and awake to-morrow morning in any

European country you wish to name. In fact we are on our way east now. To-morrow I shall show you the Seine and the Eiffel tower. By the way, I saw a monoplane crossing the Atlantic two months ago. I followed him from midocean to the English channel and saw him sail away to Paris, and perhaps to glory."

I gasped. "He did," I said breathlessly. "He is the greatest flier on earth."

He smiled and shook his head. "You are mistaken, Metters. I am the greatest flier on earth."

"You are not on earth," I corrected. "No one knows of you. You are keeping the fruits of your powers from mankind. But in your last words I detect a yearning for the world and its ways. There is still a touch of vanity."

"A yearning for the world!" Captain Hedron spat at the earth below. "The filthy world! Why should I give the fruits of my labors to that race of nothings? They have done nothing for me. Yet I have a right to vanity. I alone can conquer the world with this ship."

"Perhaps you are right," I said finally.

His eyes blazed. "Yes, I am right, Metters. Nor do I wish to hear a single criticism from you again. Do you understand that?"

I assured him I did.

He arose and looked off into the clouds His hand sought a door knob. He opened the door and started into the next room. "I want peace," he said. His voice was hoarse and scarcely audible.

He closed the door softly and locked me in the room. Then he went to the instrument board and changed a switch or two. I felt the rush of heavy air into my cabin and wondered at its warmth. He turned a dial and pulled another switch, upon which movement the great "Glorie" rolled slightly, her bow lifted, and she gathered speed in the darkness of my first night aboard.

In the Cabin of the Glories

THE next few hours constituted the most weird experience of my life, over which I look with a feeling of humility and utter unimportance. I had thought that my vocation as an aviator afforded me the respect of science and the world at large, until I began to assume that I was a pioneer and a leader of men. Yet, fearless as I had been all my life, I had never been awe-stricken or fascinated by my work. In fact, everything I did seemed routine-like and ordinary, even to stepping into space from an airplane which had conked and dropping ten thousand feet to earth. And once I dodged bullets from a machine gun for hours at a time. I had seen the works of science and invention and read the words of wise philosophers. Not one of these, even in its deepest meaning, was important after I found myself in the cabin of the Glorie. The people of the earth, all the things of the earth, became simple and ordinary, meaningless nothings. It was the attitude into which Captain Hedron had initiated me.

Again, as the great ship sped on her way through the trackless wastes of the upper strata, I wondered how one could be happy without experiencing the trials of the earth. I thought of the girl, the captain's daughter, and wondered if she really wished to be with her father here where she could not dance and dress and enjoy the beautiful things of life. I wondered—far into the night. Then the captain came and sat with me to explain in his own philosophical way the fascinating mysteries which surrounded me.

"We have not changed our natures since leaving the world Metters," he said "We, like all human beings, are bound to the craving for the new and to the love and respect for the old. Thus we have music, a series of pipes through which the wind blows while we are under way. You will hear my daughter play before long. However, I trust you will abide by my wishes and never speak to her. Leave her in the spell of the silent ether."

I nodded half-heartedly.

"Those motors are the most wonderful of all inventions, with the possible exception of the metal of which this craft is built. And I think our lives would be incomplete without even one of the machines I have invented. For instance, the machine for extracting food from the air is so constructed as to furnish the proper nourishment and balance to maintain our bodies. To you that seems intricate and complicated, but it is the most simple of my works."

Captain Hedron followed my glance earthward to a maze of light that illuminated the sky.

"To me, only a light, Metters; to you a city—Denver."

He arose and paced the deck for some moments.

"The people of the earth, being so far behind in scientific accomplishment, will tell you that all things come of the ground. To them this is true. But they have yet to investigate and explore the air.

"There are three things aboard this craft that came of the earth: These clothes we wear, the copper wiring in the motors and the heavy pieces of iron which constitute the cores of the electro-magnets. Were it necessary, I could do away with these. Possibly I shall do so in the near future, with the exception of clothing of which I have a large supply.

"Your life is not going to be wasted, Metters. You are going to see the wonders of the air. Ten days from now you shall be at the north pole and perhaps be ignorant of the fact. Look now at the moon. Is it not a whiter moon than you have ever seen?"

I agreed with him.

"We are now at an altitude of forty thousand feet. We have been climbing steadily for thirty minutes. You saw Denver from an altitude of twenty-eight thousand feet, looking from the west. You are now the same distance east of the city, only you are higher. The lights now appear only as tiny specks on the earth."

"But does this never become monotonous, Captain?" I asked. "Are there not times when your heart aches to meet old friends and to visit old places. At this moment would you not love to be discussing the possibilities of your inventions with Edison or Ford or H. G. Wells?"

HIS face turned a livid white. I had not thought it possible that my words would produce such an effect. He raised his hand as if to ward off an attack.

"Stop! Metters, never mention that to me again! Never mention the earth, never mention men. Avoid me. I wish to God I had never seen you. I wish I were villain enough to destroy you."

He sank into one of the transparent chairs and placed his face in his hands. He ignored my apology.

"You will find a tube of food from the machine. Water is in the hydrant. I shall furnish you with an electrically-treated substance which will stop the growth of your beard. You shall never have cause to be uncomfortable. There is no dirt in the upper strata. But you may as well resign yourself to a life in the air. I shall not reveal my works to another person.

"You may visit the main cabin at will and play the organ or study the action of the air at the different altitudes. You will find great pleasure in exploring the heavens and noting the peculiar formation of other planets. But do not expect to visit them. Perhaps it is impossible, perhaps not. But an absolute vacuum exists between the planets. A gas bag would never endure there. I once tried the experiment of cruising at an altitude of twenty miles, thinking I should gain such an altitude as to remain motionless while the earth turned beneath me. The experiment did not work. I found that, in order to accomplish it, I would have to do away with my gas bag, and in so doing I would land down there." He pointed earthward.

"I shall never land, Metters. I hate the world. I detest little men, with all their vanity and stupidity. They are so many parrots and monkeys, so many leeches and selfish fools. Even you are a fool, Metters, and so am I. But we were made thus. Our limitations make us fools. The natures of the people on earth make them fools.

"I see them following the call of an exploiter, attracted by the mirage of wealth or the flame of love and happiness. Neither are gained in their entirety. Among the mass I find a few whose minds are not earthbound, whose hearts are bigger than the hearts of those who surround them. But those same ones are suppressed. I myself dreamed of a world in which all men were working to make each other happy. I dreamed of truth and understanding everywhere. I dreamed of freedom from the domination of dishonest and corrupt people, and I was following an illusion. I was happy with the illusion until I lost the mother of my daughter."

Tears filled the eyes of the captain. His face shone in the light of the moon and there was written upon his face such a message as I had never read before. It told of a soul still in captivity, searching the depths of logic and learning to find the great first cause and ultimate of the universe. I saw through the years of his struggle to accomplish his work, daring not to give the fruits of labor to men, because he could find oblivion from earthly cares solely through keeping them a secret. I saw his eyes ever searching the heavens for a star, his soul ever crying out for a sign, and his bewilderment at the riddle of the universe. He told me of the death of his wife, a strange person who loved and understood him, who could sit with him in silence and read the innermost thoughts of his mind, even to those which he was at a loss to express. And I thought of his daughter, the woman I had so wished to see, but concerning whom I dared ask nothing.

He arose in silence and pointed to the floor, indicating that I should sleep thereon. Then he turned and disappeared through the door. Over the clicking noise of the latch I thought I detected a whisper, "Peace be still."

It was not thus with me.

A Momentous Decision

I WONDERED about Professor Hedron who had become the phantom captain of a phantom ship. And yet, despite his revelations to me, I knew him to be insane. But I could readily overlook his eccentricities, even those which prompted in him the desire to renounce the world. Despite the fact that I did excuse him and granted that he had the right to do as he wished, I could not overlook the fact that he had a daughter aboard. I did not have her own word that she wanted to be there. And I thought of the material side of my adventure, the world renown and riches which would reward the inventor of such machinery as I had seen.

I hope I can be forgiven, but I really started that moment on a train of thought, which seemed a breach of confidence. I wondered about the possibility of revealing these things to the world; I wondered whether or not I could induce the professor to land his craft before the startled eyes of millions.

Captain Hedron dropped to an altitude of thirteen thousand feet and gave me a view of Paris but, knowing there were many aircraft operating in the vicinity, he immediately climbed again, and the outlines of the city were lost behind clouds. I believe that was my last sight of Paris. I do not know. We remained at a high altitude for weeks. I was alone for the greater part of the time. Professor Hedron ignored me. Once he startled me with the announcement that we were over the north pole, only to say five days later that we were cruising over the Argentine.

My food came through a tube from the machine. I could eat at will, for there were no hours. Time meant nothing to the professor, but the monotony wore on me. I felt myself becoming queer. Then I began to wonder how he and his daughter could withstand the loneliness of the upper strata in a glasslike cage, where there were no flowers and trees, no variety save a different view of the moon and stars. There was not even variety in the weather. One of the machines, which the professor had so deftly made of that strange metal, adjusted the temperature in the cabin. And I did not venture from my cabin until I had been aboard two weeks. When I did fare forth into the main cabin where the strange organ was located, I found nothing but the same glassy deck, the same emptiness that had almost driven me mad. But a strange incident took place while I was there. I suddenly saw the curtains

of the girl's cabin being raised, and I looked upon a miracle, it seemed to me.

GLORIE was in her early twenties when I first saw her. She was white and beautiful with brown hair that had been allowed to grow and fall about her shoulders. Even here where she had been cramped up for three solid years, she moved gracefully as she came toward me. Our eyes met as she came down the aisle and opened the door leading to the main cabin. I was watching her with the deepest curiosity. She closed the door and stood looking at me, and it seemed that a look of great relief came into her face. I read in her eyes the emptiness of her life. I knew at that moment that she did not wish to be aboard the airship. I swear I saw her very soul, the soul of a person who was entirely immune from earthly temptations, but who hungered for the things that nature meant her to have—clothes and friends and flowers and trees.

I dared not speak to her. I waited for what seemed ages for her to move on, and yet I did not wish her to go. I wanted to talk with her, despite the orders of her father. Perhaps he had warned her, for she finally did turn away. She tripped across the deck, gathering up the filmy gown she wore, and seated herself at the organ. She cast one more glance at me, a look that must have made us both happy, and then she played as I had never heard any one play before.

It was the song of a far-off planet, a weird and beautiful tune that struck my heart like a bullet and sent the blood to my brain. It was fantastic and soul stirring, and it seemed to tell of the infinite of which we so fruitlessly dream. It sent my imagination to other planets beside our own; it brought pictures of war and destruction, putting me in mind of Mars. Then I remembered something else that seemed to fit the moment and the music she played. It was a battle between my plane and another plane, over the German lines in 1918, the weird drone of death dealing-monsters that winged their way through the clouds. I shall always associate the two experiences, for they both teemed with mystery and fantasy, for men did not seem real when they flew out to fight. Then the music broke suddenly, as if the life of its maker had been snuffed out in the great battle that is always going on in every human heart. Glorie looked at me again, her face beaming with joy. She looked at me for two minutes without changing her expression, and then her hands sought the invisible keys again. She seemed to read my mind and to know the music that drew the deepest sentiment from my heart.

Then she played "Mother Machree." Can you imagine that tune at an altitude of thirty thousand feet, in an airship traveling at the speed of two hundred miles per hour, and yet going to no place? The impossibility of it impressed me. It was not right. That woman was not happy, never could be there. I was deciding to do something about it when a strong hand grasped my shoulder and I turned to face the professor.

I shall never forget his face at that moment. It was a great rage that had overcome him ,and I attributed his anger to the tune Glorie had played. Before I could speak, he pointed to the door. I looked again at his daughter and saw her staring at me, wild eyed and helpless and hurt. Then I went to my own cabin.

I saw him caress the hand of his daughter as she sat there, watched him turn with tears in his eyes and go back to the control room. Then I made my final decision to break my word of honor to him. Nor would I ask him to release me. To him that would mean only one thing. I did not even think of what Glorie might think of me for breaking my word.

For three days I studied the actions of the captain as he maneuvered the ship about the skies. In that time I gained an appreciable knowledge about the handling of the craft. I learned that one of the levers manipulated the elevators, that another increased the speed of the great invisible propeller at the nose. I saw that the turning of a dial set in motion the machine which forced the food that I ate through the tube which ended in my cabin. Another lever he used to bank the ship. This lever worked on the same principle as an airplane control stick and lowered and raised the great fins at the side. Thus I gained my knowledge of the working of the ship. I decided to put that knowledge to use immediately.

A Strange Tomb

THE helpless look in Glorie's eyes told me the truth. She had been forced by her eccentric father to remain a prisoner on the airship. She had been powerless all those three years, to induce him to return to the earth. I decided it was for me to release her from her phantom prison. But I knew I must be cautious. Professor Hedron was a powerful man in both mind and body. I did not wish to injure him, nor to have the disrespect of his daughter. I knew if I acquired control of the ship by stealth and bound him with strips torn from my clothes, that I could speak to her. That was the course I decided to follow.

Two weeks later, as I reckoned time, we lifted through a maze of fog somewhere in the tropics. It was mid-day, in the sweltering heat of the sun. The professor seemed to have no control over intense heat. Nor did altitude appear to solve the problem. This enraged him. He turned the craft about and headed north. My next view of the earth came one evening four days later. We were cruising slowly when I went into the main cabin and looked through the telescope. From her own room Glorie watched me closely—I thought with intense speculation. I decided that moment not to defer my plan of action any longer. But the telescope did not reveal our position. We were over a great plain, and about us, as far as we could see, was a haze that reached into the sky like a great engulfing tide.

I left the telescope nonchalantly and turned to pacing the deck. Still Glorie watched me. I tried to face her squarely and found it impossible. She must have detected my purpose at that moment, for her eyes widened, and she smiled upon me when I looked again. It was a pitiful, wistful smile, like that of a child that wishes something for which it dares not ask. I smiled back

(*Continued on page* 369)

The DESERT of ICE

By Jules Verne

Concluding the Sequel to "The English at the North Pole."

What Went Before:

RICHARD SHANDON receives a letter signed "K.Z. Captain of the Forward," offering him the post of chief officer, on a new brig, giving him full instructions and sufficient funds for the building of the vessel. A visit to the bank confirms the statement in the letter in regard to the funds, so he orders the brig to be built according to specifications and engages James Wall as his second mate and a man named Johnson, as boatswain. Johnson selects and engages the balance of the crew.

Dr. Clawbonny, the ship's doctor, duly arrives, just as the building of the Forward is about completed, in accordance with advice which Shandon received from the unknown captain. And on the 5th of April, when the brig is almost ready to sail, the captain's dog, Duk by name, arrives. The captain had apprised Shandon of the animal's expected arrival and even ordered a kennel to be built for him.

The balance of the crew consists of Simpson, the harpooner; Bell, the carpenter; Foker, the ice-master; and Garry, Bolton, Brunton, Gripper, Clifton, Warren and Pen, sailors.

Though the captain is expected to make himself known at the moment of starting, he only sends a last minute letter of instruction as to the course of the expedition. They start off for points North, through Davis Strait, Baffin Bay and clear into the Arctic regions and—following later mysterious instructions by letter—into arctic waters.

It is not until after the brig and crew leave Upernavik and the icebergs become more numerous and the waters become almost unnavigable, and some of the sailors begin to threaten mutiny, that the captain, who had passed as the sailor named Garry, appears and discloses his plans. He is none other than Captain Hatteras, who had some years before spent an enormous amount of money and sacrificed the lives of all of his crew in a mad attempt to reach the North Pole and plant the English flag there. He offers the men a tempting additional sum of money for every degree they push beyond the 82nd parallel, and the men eagerly accept the proposition—for the time being at least—and they start pushing ahead again.

But more hardships follow and sickness due to the freezing temperature sets in, and mutiny becomes imminent once more. But by Christmas it is impossible to move ahead and there is no more coal aboard. The crew decide to use some of the wood of the Forward *that can best be spared and then Bell remembers that about 100 miles across the ice from where they are marooned, there was a deposit of coal which was left there some years earlier by a rescue expedition. Hatteras decides to seek the coal. He, the doctor, Bell and Simpson, start out, accompanied by the faithful Duk. Johnson was left behind to watch the sloop. Simpson, however, finally succumbs to the hardships attending this trip across the ice-fields, and is buried* en route.

When the rest of the group reach the station, they find no trace of any coal or provisions, but they discover a cairn. A man is found buried in the snow. The doctor finds the way that he can be revived. They learn later that he is an American and came on the ship, Porpoise.

The party return to find the Forward *in flames and Johnson doing his best to fight the fire. Hope is not lost however, for when the American, Altamont, regains consciousness he tells them that the* Porpoise *is only a little way further north, amply provisioned with food and coal, and they start off on sleds toward the American ship. On the 24th, after much discouragement, they reach the* Porpoise *and they have a fitting celebration, in which the doctor is master of ceremonies and helps in the naming of the surrounding territory. But still all is not well, for there is now another electric charge in the air. Who will be captain? Hatteras or Altamont?*

Part II

CHAPTER IX
Cold and Heat

HATTERAS and Johnson had been getting somewhat uneasy at the prolonged absence of their companions, and were delighted to see them back safe and sound. The hunters were no less glad to find themselves once more in a warm shelter, for the temperature had fallen considerably as night drew on, and the thermometer outside was far below zero.

The poor hunters were half frozen, and so worn out that they could hardly drag their limbs along; but the stoves were roaring and cracking cheerily, and the big kitchen fire waiting to cook such game as might be brought in. Clawbonny donned his official apron again, and soon had his seal cutlets dressed and smoking on the table. By nine o'clock the whole party were enjoying a good supper, and Bell couldn't help exclaiming: "Well, even at the risk of being taken for an Esquimau I must confess eating is the most important business in these regions."

They all had their mouths crammed too full to speak, but the Doctor signified his agreement with Bell's views by an approving nod.

The cutlets were pronounced first-rate, and it seemed as if they were, for they were all eaten, to the

ONLY a few years ago Amundsen and Scott in two separate expeditions, reached the South Pole. Much to the disappointment of Scott, the Norwegian got there first. Both, however, reached the top of the ten thousand foot mountain on which the South Pole lies, and planted a flag there. Scott died before reaching his ship.

It seems uncanny, considering the meagerness of information about either the North or the South Pole, which was available in Verne's time, that he should have been able to foretell, almost with exactitude, something that was to be discovered 100 years later at the South Pole.

It is particularly interesting to note that most of what Jules Verne said in his concluding chapters, almost a hundred years ago, has been pretty much proven true of the South Pole, recently.

He had hardly uttered the words before Hatteras, by a superhuman effort, sprang over the boiling lava, and was beyond the reach of his companions.

very last morsel. For dessert they had coffee, which the Doctor brewed himself in a French coffee-pot over the alcohol lamp. He never allowed anybody else to concoct this precious beverage; for he made a point of serving it boiling hot, always declaring it was not fit to drink unless it burned his tongue. This evening he took it so scalding that Altamont exclaimed:

"You'll skin your throat!"

"Not a bit of it," was the Doctor's reply.

"Then your palate must be copper-sheathed," said Johnson.

"Not at all, friends. I advise you to copy my example. Many persons, and I am one, can drink coffee at a temperature of 131°."

"131°?" said Altamont; "why, that is hotter than the hand could bear!"

"Of course it is, Altamont, for the hand could not bear more than 122°, but the palate and tongue are less sensitive."

"You surprise me."

"Well, I will convince you it is fact," returned Clawbonny, and taking up a thermometer, he plunged it into the steaming coffee. He waited till the mercury rose as high as 131° and then withdrew it, and swallowed the liquid with evident gusto.

Bell tried to follow his example, but burned his mouth severely.

"You are not used to it," said the Doctor, coolly.

"Can you tell us, Clawbonny," asked Altamont, "what is the highest temperature that the human body can bear?"

"Yes; several curious experiments have been made in that respect. I remember reading of some servant girls, in the town of Rochefoucauld, in France, who could stay ten minutes in a baker's large oven when the temperature was 300°, while potatoes and meat were cooking all around them."

"What girls!" exclaimed Altamont.

"Well, there is another case, where eight of our own countrymen—Fordyce, Banks, Solander, Blagdin, Home, Nooth, Lord Seaforth, and Captain Phillips—went into one as hot as 200°, where eggs and beef were frizzling."

"And they were Englishmen!" said Bell, with a touch of national pride.

"Oh, the Americans could have done better than that," said Altamont.

"They would have roasted," returned the Doctor, laughing. "At all events, they have never tried it, so I shall stand up for my countrymen. There is one more instance I recollect, and really it is so incredible that it would be impossible to believe it if it were not attested by unimpeachable evidence. The Duke of Ragusa and Dr. Jung, a Frenchman, and an Austrian, saw a Turk plunge into a bath at 170°."

"But that is not so astonishing as those servant girls, or our own countrymen," said Johnson.

"I beg your pardon," replied Clawbonny; "there is a great difference between plunging into hot air and hot water. Hot air produces perspiration, which protects the skin, but boiling water scalds. The *maximum* heat of baths is 107°, so that this Turk must have been an extraordinary fellow to endure such temperature."

"What is the mean temperature, Dr. Clawbonny, of animated beings?" asked Johnson.

"That varies with the species," replied the Doctor. "Birds have the highest, especially the duck and the hen. The mammalia come next, and then human beings; the temperature of Englishmen averages 98.5°."

"I am sure Mr. Altamont is going to claim a higher rate for his countrymen," said Johnson, smiling.

"Well, sure enough, we've some precious hot ones among us, but, as I never have put a thermometer down their throats to ascertain, I can't give you statistics."

"There is no sensible difference," said the Doctor, "between men of different races when they are placed under the same conditions, whatever their food may be. I may almost say their temperature would be the same at the Equator as at the Pole."

"Then the heat of our bodies is the same here as in England," replied Altamont.

"Just about it. The other species of mammalia are generally hotter than human beings. The horse, the hare, the elephant, the porpoise, and the tiger are nearly the same; but the cat, the squirrel, the rat, the panther, the sheep, the ox, the dog, the monkey and the goat, are as high as 103°; and the pig is 104°.

"Rather humiliating to us," put in Altamont.

"Then come the amphibia and the fish," resumed the Doctor, "whose temperature varies with that of the water. The serpent has a temperature of 80°, the frog 70°, and the shark several degrees less. Insects appear to have the temperature of air and water.

"All this is very well," interrupted Hatteras, who had hitherto taken no part in the conversation, "and we are obliged to the Doctor for his scientific information; but we are really talking as if we were going to brave the heat of the torrid zone. I think it would be far more seasonable to speak of cold, if the Doctor could tell us what is the lowest temperature on record?"

"I can enlighten you on that too," replied the Doctor. "There are a great number of memorable winters, which appear to have come at intervals of about forty-one years. In 1364, the Rhone was frozen over as far as Arles; in 1408, the Danube was frozen throughout its entire extent, and the wolves crossed the Cattegat on firm ground; in 1509, the Adriatic and the Mediterranean were frozen at Venice and Marseilles, and the Baltic on the 10th of April; in 1608, all the cattle died in England from the cold; in 1789, the Thames was frozen as far as Gravesend; and the frightful winter of 1813 will long be remembered in France. The earliest and longest ever known in the present century was in 1829. So much for Europe."

"But here, within the Polar circle, what is the lowest degree?" asked Altamont.

"My word!" said the Doctor. "I think we have experienced the lowest ourselves, for one day the thermometer was 72° below zero; and, if my memory serves me right, the lowest temperature mentioned hitherto by the Arctic voyagers has been 61° at Melville Island, 65° at Port Felix, and 70° at Fort Reliance, all below zero."

"Yes," said Hatteras, "for it was the unusual severity of the winter that barred our progress, for it came on just at the worst time possible."

"You were stopped, you say?" asked Altamont, looking fixedly at the captain.

"Yes, in our voyage west," the Doctor hastened to reply.

"Then the maximum and minimum temperatures," said Altamont, resuming the conversation, "are about 200° apart. So you see, my friends, we may make ourselves easy."

"But if the sun were suddenly extinguished," suggested Johnson, "would not the earth's temperature be far lower?"

"There is no fear of such a catastrophe; but even should it happen, the temperature would be scarcely any different."

"That's curious."

"It is; but Fourrier, a learned Frenchman, has proved the fact incontestably. If it were not the case, the difference between day and night would be far greater, as also the degree of cold at the Poles. But now, I think, friends, we should be better for a few hours' sleep. Who has charge of the stove?"

"It is my turn to-night," said Bell.

"Well, pray keep up a good fire, for it is a perishing night."

CHAPTER X
Winter Pleasures

IT is a dreary affair to live at the Pole, for there is no going out for many long months, and nothing to break the weary monotony.

The day after the hunting excursion was dark and snowy, and Clawbonny could find no occupation except polishing up the ice walls of the hut as they became damp with the heat inside, and emptying out the snow which drifted into the long passage leading to the inner door. The "Doctor's House" stood out well, defying storm and tempest, and the snow only seemed to increase the thickness of the walls.

The storehouses, too, did not give way in the least; but though they were only a few yards off, it was found necessary to lay in enough provisions for the day, as very often the weather made it almost impossible to venture out.

The unloading of the *Porpoise* turned out to have been a wise precaution, for she was slowly but surely being crushed to pieces by the silent, irresistible pressure around her. Still the Doctor was always hoping enough planks might be sufficiently sound to construct a small vessel to convey them back to England; but the right time to build had not yet come.

The five men were consequently compelled to spend the greater part of the day in complete idleness. Hatteras lolled on his bed, absorbed in thought. Altamont smoked or dozed, and the Doctor took care not to disturb either of them, for he was in perpetual fear of a quarrel between them.

At meal times he always led the conversation away from irritating topics, and sought, as far as possible, to instruct and interest all parties. Whenever he was not engaged with the preparation of his notes, he gave them dissertations on history, geography, or meteorology, handling his subject in an easy, though philosophical manner, drawing lessons from the most trivial incidents. His inexhaustible memory was never at a loss for fact or illustration, while his good humor and geniality made him the life and soul of the little company. He was implicitly trusted by all, even by Hatteras, who cherished a deep affection for him.

Yet no man felt the compulsory confinement more painfully than Clawbonny. He longed ardently for the breaking up of the frost, to resume his excursions, though he dreaded the rivalry that might ensue between the two captains.

Yet things must come to a crisis soon or late, and meantime, he resolved to use his best endeavors to bring both parties to a better mind. But to reconcile an American and an Englishman was no easy task. He and Johnson had many a talk on the subject, for the old sailor's views quite coincided with his own as to the difficult complications which awaited them.

However, the bad weather continued, and leaving Fort Providence, even for an hour, was out of the question. Day and night they were pent up in these glittering icewalls, and time hung heavily on their hands, at least on all but the Doctor's, and he always managed to find some occupation for himself.

"I declare," said Altamont one evening, "life like this is not worth having! We might as well be some of those reptiles that sleep all the winter. But I suppose there is no help for it."

"I am afraid not," said the Doctor; "unfortunately we are too few in number to get up any amusement."

"Then you think if there were more of us, we should find more to do?"

"Of course: when whole ships' crews have wintered here, they have managed to while away the time famously."

"Well, I must say I should like to know how. It would need a vast amount of ingenuity to extract anything amusing out of our circumstances. I suppose they did not play at charades?"

"No, but they introduced the press and the theater."

"What? They had a newspaper?" exclaimed the American.

"They acted a comedy?" said Bell.

"That they did," said the Doctor. "When Parry wintered at Melville Island, he started both amusements among his men, and they met with great success."

"Well, I must confess, I should like to have been there," returned Johnson.

"Curious and amusing too, my good Johnson. Lieutenant Beechey was the theater manager, and Captain Sabina chief editor of the newspaper called *The Winter Chronicle*, or the *Gazette of Northern Georgia*.

CHAPTER XI
Traces of Bears

ON the 26th of April, during the night, there was a sudden change in the weather. The thermometer fell several degrees, and the inmates of

Doctor's House could hardly keep themselves warm even in their beds. Altamont had charge of the stove, and he found it needed careful replenishing to preserve the temperature at 50° above zero.

This increase of cold betokened the cessation of the stormy weather, and the Doctor hailed it gladly as the harbinger of his favorite hunting and exploring expeditions.

He rose early next morning, and climbed up to the top of the cone. The wind had shifted north, the air was clear, and the snow was firm and smooth to the tread.

Before long the five companions had left Doctor's House, and were busily engaged in clearing the heavy masses of snow off the roof and sides, for the house was no longer distinguishable from the plateau, as the snow had drifted to a depth of full fifteen feet. It took two hours to remove the frozen snow, and restore the architectural form of the dwelling. At length the granite foundations appeared, and the storehouses and powder magazines were once more accessible.

But as, in so uncertain a climate, a storm might cut off their supplies any day, they wisely resolved to provide for any such emergency by carrying over a good stock of provisions to the kitchen; and then Clawbonny, Altamont, and Bell started off with their guns in search of game, for the want of fresh food began to be urgently felt.

The three companions went across the east side of the cone, right down into the center of the far-stretching, snow-covered plain beneath, but they did not need to go far, for numerous traces of animals appeared on all sides within a circle of two miles round Fort Providence.

After gazing at these traces for some minutes, the hunters looked at each other silently, then the Doctor exclaimed:

"Well, these are plain enough, I think!"

"Ay, only too plain," added Bell; "bears have been here!"

"First-rate game!" said Altamont. "There's only one fault about it."

"And what is that?" asked Bell.

"Too much of it."

"What do you mean?"

"I mean this—there are distinct traces of five bears."

"Are you sure there are five?" said Clawbonny.

"Look and see for yourself. Here is one footprint, and there is another quite different. These claws are far wider apart than those; and see here, again, that paw belongs to a much smaller bear. I tell you, if you look carefully, you will see the marks of all five different bears distinctly."

"You're right," said Bell, after a close inspection.

"If that's the case, then," said the Doctor, "we must take care what we're about, and not be foolhardy, for these animals are starving after the severe winter, and they might be extremely dangerous to encounter, and, since we are sure of their number—"

"And of their intentions, too," put in Altamont.

"You think they have discovered our presence here?"

"No doubt of it, unless we have got into a bear-pass. But then, why should these footprints be in a circle round our fort? Look, these animals have come from the southeast, and stopped at this place, and commenced to reconnoiter the coast."

"You're right," said the Doctor, "and, what's more, it is certain that they have been here last night."

"And other nights before that," replied Altamont.

"I don't think so," rejoined Clawbonny. "It is more likely that they waited till the cessation of the tempest, and were on their way down to the bay, intending to catch seals, when they scented us."

"Well, we can easily find out, if they come to-night," said Altamont.

"How?"

"By effacing all the marks in a given place. And if to-morrow we find fresh ones, it will be evident that Fort Providence is the goal for which the bears are bound."

"Very good, at any rate we shall know, then, what we have to expect."

The three hunters set to work, and scraped the snow over till all the footprints were obliterated for a considerable distance.

"We shall soon see," said Altamont.

"And, meantime, we had best go on," added the Doctor, "and keep a sharp look-out."

But not a sign of anything living was visible, and after a time they returned to the snow-house.

Hatteras and Johnson were informed how matters stood, and it was resolved to maintain a vigilant watch. Night came, but nothing disturbed its calm splendor.

Next morning at early dawn, Hatteras and his companions, well armed, went out to reconnoiter the state of the snow. They found the same identical footmarks, but somewhat nearer. Evidently the enemy was bent on the siege of Fort Providence.

"But where can the bears be?" said Bell.

"Behind the icebergs watching us," replied the Doctor. "Don't let us expose ourselves imprudently."

"What about going hunting, then?" asked Altamont.

"We must put it off for a day or two, I think, and rub out the marks again, and see if they are renewed to-morrow."

The Doctor's advice was followed, and they entrenched themselves for the present in the fort. The lighthouse was taken down, as it was not of actual use meantime, and might help to attract the bears. Each took it in turn to keep watch on the upper plateau.

The day passed without a sign of the enemy's existence, and next morning, when they hurried eagerly out to examine the snow, judge their astonishment to find it wholly untouched!

"Capital!" exclaimed Altamont. "The bears are put off the scent; they have no perseverance, and have grown tired waiting for us. They are off, and a good riddance."

"Softly, softly," said the Doctor; "I am not so sure they have gone. I think we had better wait one day more. It is evident the bears have not been here last night, at least on this side; but still—"

"Well, let us go right round the plateau, and see how

things stand," said the always impatient Altamont.

"All right," said Clawbonny. "Come along."

Away they went, but it was impossible to scrutinize carefully a track of two miles. No trace of the enemy was discoverable.

"Now, then, can't we go hunting?" said Altamont.

"Wait till to-morrow," urged the Doctor again.

His friend was very unwilling to delay, but yielded the point at last, and returned to the fort.

As on the preceding night, each man took his hour's watch on the upper plateau. When it came to Altamont's turn, and he had gone out to relieve Bell, Hatteras called his old companion round him. The Doctor left his desk and Johnson his cooking, and hastened to their captain's side, supposing he wanted to talk over their perilous situation; but Hatteras never gave it a thought.

"My friends," he said, "let us take advantage of the American's absence to speak of business. There are things which cannot concern him, and with which I do not wish him to meddle."

Johnson and Clawbonny looked at each other, wondering what the captain was driving at.

"I wish," he continued, "to talk with you about our plans for the future."

"All right; talk away," said the Doctor.

"In a month, or six weeks at the outside, the time for making distant excursions will come again. Have you thought of what we had better undertake in summer?"

"Have you, captain?" asked Johnson.

"Have I? I may say that not an hour of my life passes without revolving in my mind my one cherished purpose. I suppose not a man among you intends to retrace his steps?"

No one replied, and Hatteras went on to say:

"For my own part, even if I must go alone, I will push on to the North Pole. Never were men so near it before, for we are not more than 360 miles distant at most; and I will not lose such an opportunity without making every attempt to reach it, even though it be an impossibility. What are your views, Doctor?"

"Your own, Hatteras."

"And yours, Johnson?"

"Like the Doctor's."

"And yours, Bell?"

"Captain," replied the carpenter, "it is true we have neither wives nor children waiting us in England, but, after all, it is one's country—one's native land! Have you no thoughts of returning home?"

"We can return after we have discovered the Pole quite as well as before, and even better. Our difficulties will not increase, for as we near the Pole we get away from the point of greatest cold. We have fuel and provisions enough. There is nothing to stop us, and we should be culpable, in my opinion, if we allowed ourselves to abandon the project."

"Very well, captain; I'll go along with you."

"That's right; I never doubted you," said Hatteras. "We shall succeed, and England will have all the glory."

"But there is an American with us!" said Johnson.

Hatteras could not repress an impatient exclamation.

"I know it!" he said, in a stern voice.

"We cannot leave him behind," added the Doctor.

"No, we can't," repeated Hatteras, almost mechanically.

"And he will be sure to go too."

"Yes, he will go too; but who will command?"

"You, captain."

"And if you all obey my orders, will the Yankee refuse?"

"I shouldn't think so; but suppose he should?"

"He and I must fight it out, then?"

The three Englishment looked at Hatteras, but said nothing. Then the Doctor aske how he proposed they should go?

"By the coast, as far as possible," was the reply.

"But what if we find open water, as is likely enough?"

"Well, we'll go across it."

"But we have no boat."

Hatteras did not answer, and looked very much embarrassed.

"Perhaps," suggested Bell, "we might make a boat out of some of the planks of the *Porpoise*."

"Never!" exclaimed Hatteras, vehemently.

"Never!" said Johnson.

The Doctor shook his head. He understood the feeling of the captain.

"Never!" reiterated Hatteras. "A boat made out of an American ship would be an American!"

"But captain—" began Johnson.

The Doctor made a sign to the old boatswain not to press the subject further, and resolved in his own mind to reserve the question for discussion at a more opportune moment. He managed to turn the conversation to other matters, till it abruptly terminated by the entrance of Altamont.

This ended the day, and the night passed quietly without the least disturbance. The bears had evidently disappeared.

CHAPTER XII

Imprisoned in Doctor's House

THE first business next day was to arrange for a hunt. It was settled that Altamont, Bell, and Hatteras should form the party, while Clawbonny should go and explore as far as Johnson Island and make some hydrographic notes, and Johnson should remain behind to keep house.

The three hunters soon completed their preparations. They armed themselves each with a double-barreled pistol and a rifle, and took plenty of powder and bullets. Each man also carried in his belt his indispensable snow knife and hatchet and a small supply of pemmican in case night should surprise them before their return.

Thus equipped, they could go far, and might count on a good supply of game.

At eight o'clock they started, accompanied by Duk, who frisked and gamboled with delight. They went up the hill to the east, across the cone, and down into the plain below.

The Doctor next took his departure, after agreeing with Johnson on a signal of alarm in case of danger.

The old boatswain was left alone, but he had plenty to do. He began by unfastening the Greenland dogs, and letting them out for a run, after their long, wearisome confinement. Then he attended to divers housekeeping matters. He had to replenish the stock of combustibles and provisions, to arrange the store-houses, to mend several broken utensils, to repair the rents in coverlets, and get new shoes ready for summer excursions. There was no lack of work, and the old sailor's nimble, clever fingers could do anything.

While his hands were busy, his mind was occupied with the conversation of the preceding evening. He pondered with regret over the captain's obstinacy, and yet he felt that there was something grand and even heroic in his determination that neither an American nor an American ship should first touch the Pole.

The hunters had gone about an hour when Johnson suddenly heard the report of a gun.

"Capital!" he exclaimed. "They have found something, and pretty quickly too, if we can hear their guns so distinctly. The atmosphere must be very clear."

A second and a third shot followed.

"Bravo!" again exclaimed the boatswain; "they must have fallen in luck's way!"

But when three more shots came in rapid succession, the old man turned pale, and a horrible thought crossed his mind which made him rush out and climb hastily to the top of the cone. He shuddered at the sight which met his eyes. The three hunters, followed by Duk, were tearing home at full speed, followed by the five huge bears! Their six balls had evidently taken no effect, and the terrible monsters were close on their heels. Hatteras, who brought up the rear, could only manage to keep off his pursuers by flinging down one article after another—first his cap, then his hatchet, and, finally, his gun. He knew that the inquisitive bears would stop and examine every object, sniffing all round it, and this gave him a little time. Otherwise he could not have escaped, for these animals outstrip the fleetest horse, and one monster was so near that Hatteras had to brandish his knife vigorously, to ward off a tremendous blow of his paw.

At last, though panting and out of breath, the three men reached Johnson safely, and slid down the rock with him into the snow-house. The bears stopped short on the upper plateau, and Hatteras and his companions lost no time in barring and barricading them out.

"Here we are at last!" exclaimed Hatteras; "we can defend ourselves better now. It is five against five."

"Four!" said Johnson, in a frightened voice.

"How?"

"The Doctor!" replied Johnson, pointing to the empty sitting-room. "He is on Johnson's Island."

"A bad job for him," said Bell.

"But we can't leave him to his fate, in this fashion," said Altamont.

"No; let's be off to find him at once," replied Hatteras. He opened the door, but soon shut it, narrowly escaping a bear's hug. "They are there!" he exclaimed.

"All?" asked Bell.

"The whole pack."

Altamont rushed to the windows, and began to fill up the deep embrasure with blocks of ice, which he broke off the walls of the house.

His companions followed his example silently. Not a sound was heard but the low, deep growl of Duk.

To tell the simple truth, however, it was not their own danger that occupied their thoughts, but that of their absent friend, the Doctor. It was for him they trembled, not for themselves. Poor Clawbonny, so good and devoted as he had been to every member of the little colony! This was the first time they had been separated from him. Extreme peril and most likely a frightful death awaited him, for he might return unsuspectingly to Fort Providence, and find himself in the power of these ferocious animals.

"And yet," said Johnson, "unless I am much mistaken, he must be on guard. Your repeated shots cannot but have warned him. He must surely be aware that something unusual has happened."

"But suppose he was too far away to hear them," replied Altamont, "or has not understood the cause of them? It is ten chances to one but he'll come quickly back, never imagining the danger. The bears are screened from sight by the crag completely."

"We must get rid of them before he comes," said Hatteras.

"But how?" asked Bell.

It was difficult to reply to this, for a sortie was out of the question. They had taken care to barricade the entrance passage, but the bears could easily find a way in if they chose. So it was thought advisable to keep a close watch on their movements outside, by listening attentively in each room, so as to be able to resist all attempts at invasion. They could distinctly hear them prowling about, growling and scraping the walls with their enormous paws.

However, some action must be taken speedily, for time was passing. Altamont resolved to try a port-hole through which he might fire on his assailants. He had soon scooped out a hole in the wall, but his gun was hardly pushed through when it was seized with irresistible force, and wrested from his grasp before he could even fire.

"Confound it!" he exclaimed, "we're no match for them."

This state of things had lasted upwards of an hour, and there seemed no prospect of a termination. The question of a sortie began now to be seriously discussed. There was little chance of success, as the bears could not be attacked separately, but Hatteras and his companions had grown so impatient, and it must be confessed were also so much ashamed of being kept in prison by beasts, that they would even have dared the risk, if the captain had not suddenly thought of a new mode of defense.

He took Johnson's furnace-poker, and thrust it into the stove, while he made an opening in the snow wall, or rather a partial opening, for he left a thin sheet of ice on the outer side. As soon as the poker was red-hot

he said to his comrades, who stood eagerly watching him, wondering what he was going to do:

"This red-hot bar will keep off the bears when they try to get hold of it, and we shall be able easily to fire across it without letting them snatch away our guns."

"A good idea;" said Bell, posting himself beside Altamont.

Hatteras withdrew the poker, and instantly plunged it in the wall. The melting snow made a loud hissing noise, and two bears ran and made a snatch at the glowing bar; but they fell back with a terrible howl, and at the same moment four shots resounded, one after the other.

"Hit!" exclaimed Altamont.

"Hit!" echoed Bell.

"Let us repeat the dose," said Hatteras, carefully stopping up the opening meantime.

The poker was again thrust into the fire, and in a few minutes was ready for Hatteras to recommence operations.

Altamont and Bell reloaded their guns, and took their places; but this time the poker would not pass through.

"Confound the beasts;" exclaimed the impetuous American.

"What's the matter?" asked Johnson.

"What's the matter? Why, those plaguey animals are piling up block after block, intending to bury us alive!"

"Impossible!"

"Look for yourself; the poker can't get through. I declare it is getting absurd now."

It was worse than absurd; it was alarming. Things grew worse. It was evident that the bears meant to stifle their prey, for the sagacious animals were heaping up huge masses, which would make escape impossible.

"It is too bad," said old Johnson, with a mortified look. "One might put up with men, but bears!"

Two hours elapsed without bringing any relief to the prisoners; to go out was impossible, and the thick walls excluded all sound. Altamont walked impatiently up and down, full of exasperation and excitement at finding himself worsted for once. Hatteras could think of nothing but the Doctor, and of the serious peril which threatened him.

"Oh, if Dr. Clawbonny were only here!" said Johnson.

"What could he do?" asked Altamont.

"Oh, he'd manage to get us out somehow."

"How, pray?" said the American, crossly.

"If I knew that, I should not need him. However, I know what his advice just now would be."

"What?"

"To take some food; that can't hurt us. What do you say, Mr. Altamont?"

"Oh, let's eat, by all means, if that will please you, though we're in a ridiculous, not to say humiliating plight."

"I'll bet you we'll find a way out after dinner."

No one replied, but they seated themselves round the table. Johnson, trained in Clawbonny's school, tried to be brave and unconcerned about the danger, but he could scarcely manage it. His jokes stuck in his throat. Moreover, the whole party began to feel uncomfortable. The atmosphere was getting dense, for every opening was hermetically sealed. The stoves would hardly draw, and it was evident they would soon go out altogether for want of oxygen.

Hatteras was the first to see their fresh danger, and he made no attempt to hide it from his companions.

"If that is the case," said Altamont, "we must get out at all risks."

"Yes," replied Hatteras; "but let us wait till night. We will make a hole in the roof, and let in a provision of air, and then one of us can fire out of it on the bears."

"It is the only thing we can do, I suppose," said Altamont.

So it was agreed; but waiting was hard work, and Altamont could not refrain from giving vent to his impatience by thundering maledictions on the bears, and abusing the ill fate which had placed them in such an awkward and humbling predicament. "It was beasts *versus* men," he said, "and certainly the men cut a pretty figure."

CHAPTER XIII
The Mine

NIGHT drew on, and the lamp in the sitting-room already began to burn dim for want of oxygen. At eight o'clock the final arrangements were completed, and all that remained to do was to make an opening in the roof.

They had been working away at this for some minutes, and Bell was showing himself quite an adept at the business, when Johnson, who had been keeping watch in the sleeping room, came hurriedly in to his companions, pulling such a long face that the captain asked immediately what was the matter.

"Nothing exactly," said the old sailor, "and yet——"

"Come, out with it!" exclaimed Altamont.

"Hush! don't you hear a peculiar noise?"

"Where?"

"Here, on this side, on the wall of the room."

Bell stopped working, and listened attentively like the rest. Johnson was right; a noise there certainly was on the side wall, as if someone were cutting the ice.

"Don't you hear it?" repeated Johnson.

"Hear it? Yes, plain enough," replied Altamont.

"Is it the bears?" asked Bell.

"Most assuredly."

"Well, they have changed their tactics," said old Johnson, "and given up the idea of suffocating us."

"Or maybe they suppose we are suffocated by now," suggested the American, getting furious at his invisible enemies.

"They are going to attack us," said Bell.

"Well, what of it?" returned Hatteras.

"We shall have a hand-to-hand struggle, that's all."

"And so much the better," added Altamont; "that's far more to my taste; I have had enough of invisible foes—let me see my antagonist, and I can fight him."

"Ay," said Johnson; "but not with guns. They would be useless here."

"With knife and hatchet then," returned the American.

The noise increased, and it was evident that the point of attack was the angle of the wall formed by its junction with the cliff.

"They are hardly six feet off now," said the boatswain.

"Right, Johnson!" replied Altamont; "but we have time enough to be ready for them."

And seizing a hatchet, he placed himself in fighting attitude, planting his right foot firmly forward and throwing himself back.

Hatteras and the others followed his example, and Johnson took care to load a gun in case of necessity.

Every minute the sound came nearer, till at last only a thin coating separated them from their assailants.

Presently this gave way with a loud crack, and a huge dark mass rolled over into the room.

Altamont had already swung his hatchet to strike, when he was arrested by a well-known voice, exclaiming:

"For Heaven's sake, stop!"

"The Doctor! the Doctor!" cried Johnson.

And the Doctor it actually was who had tumbled in among them in such undignified fashion.

"How do ye do, good friends?" he said, picking himself smartly up.

His companions stood stupefied for a moment, but joy soon loosened their tongues, and each rushed eagerly forward to welcome his old comrade with a loving embrace. Hatteras was for once fairly overcome with emotion, and positively hugged him like a child.

"And is it really you, Dr. Clawbonny?" said Johnson.

"Myself and nobody else, my old fellow. I assure you I have been far more uneasy about you than you could have been about me."

"But how did you know we had been attacked by a troop of bears?" asked Altamont. "What we were most afraid of was that you would quickly come back to Fort Providence, never dreaming of the danger you were rushing into."

"Oh, I saw it all. Your repeated shots gave me the alarm. When you commenced firing I was beside the wreck of the *Porpoise*, but I climbed up a hummock, and discovered five bears close on your heels. Oh, how anxious I was for you! But when I saw you disappear down the cliff, while the bears stood hesitating on the edge, as if uncertain what to do, I felt sure that you had managed to get safely inside the house and barricade it. I crept cautiously nearer, sometimes going on all-fours, sometimes slipping between great blocks of ice, till I came at last quite close to our fort, and then I found the bears working away like beavers. They were prowling about the snow, and dragging enormous blocks of ice towards the house, piling them up like a wall, evidently intending to bury you alive. It is a lucky thing they did not take it into their heads to dash down the blocks from the summit of the cone, for then you must have been crushed inevitably."

"But what danger you were in, Dr. Clawbonny," said Bell. "Any moment they might have turned round and attacked you."

"They never thought of it, even. Johnson's Greenland dogs came in sight several times, but they did not take the trouble to go after them. No, they imagined themselves sure of a more savory supper!"

"Thanks for the compliment!" said Altamont, laughing.

"Oh, there is nothing to be proud of. When I saw what the bears were up to, I determined to get back to you by some means or other. I waited till night, but as soon as it got dark I glided noiselessly along towards the powder-magazine. I had reasons for choosing that point from which to work my way hither, and I speedily commenced operations with my snow-knife. A famous tool it is. For three mortal hours I have been hacking and heaving away, but here I am at last, tired enough and starving, but still safe here."

"To share our fate!" said Altamont.

"No, to save you all; but for mercy's sake, give me a biscuit and a bit of meat, for I am sinking for want of food."

A SUBSTANTIAL meal was soon before him, but the vivacious little man could talk all the while he was eating, and was quite ready to answer any questions.

"Did you say *to save us?*" asked Bell.

"Most assuredly!" was the reply.

"Well, certainly, if you found your way in, we can find our way out by the same road."

"A likely story! And leave the field clear for the whole pack to come in and find out our stores. Pretty havoc they would make!"

"No, we must stay here," said Hatteras.

"Of course we must," replied Clawbonny; "but we'll get rid of the bears for all that."

"I told you so," said Johnson, rubbing his hand, "I knew that nothing was hopeless if Dr. Clawbonny was here; he has always some expedient in his wise head."

"My poor head is very empty, I fear, but by dint of rummaging perhaps I——"

"Doctor," interrupted Altamont, "I suppose there is no fear of the bears getting in by the passage you have made?"

"No, I took care to stop up the opening thoroughly, and now we can reach the powder-magazine without letting them see us."

"All right; and now will you let us have your plan of getting rid of these comical assailants?"

"My plan is quite simple, and part of the work is done already."

"What do you mean?"

"You shall see. But I am forgetting that I brought a companion with me."

"What do you say?" said Johnson.

"I have a companion to introduce to you," replied

the Doctor, going out again into the passage and bringing back a dead fox, newly killed.

"I shot it this morning, and never did fox come more opportunely."

"What on earth do you mean?" asked Altamont.

"I mean to blow up the bears *en masse* with 100 pounds of powder."

"But where is the powder?" exclaimed his friends.

"In the magazine. This passage will lead to it. I made it purposely."

"And where is the mine to be?" inquired Altamont.

"At the farthest point from the house and stores."

"And how will you manage to entice the bears there, all to one spot?"

"I'll undertake that business; but we have talked enough, let us set to work. We have a hundred feet more to add to our passage to-night, and that is no easy matter; but as there are five of us, we can take turns at it. Bell will begin, and we will lie down and sleep meantime."

"Well, really," said Johnson, "the more I think of it, the more feasible seems the Doctor's plan."

"It is a sure one, anyway," said Clawbonny.

"So sure that I can feel the bears' fur already on my shoulder. Well, come, let's begin then."

Away he went into the gloomy passage, followed by Bell, and in a few moments they had reached the powder-magazine, and stood among the well-arranged barrels. The Doctor pointed out to his companion the exact spot where he began excavating, and then left him to his task, at which he labored diligently for about an hour, when Altamont came to relieve him. All the snow he had dug out was taken to the kitchen and melted, to prevent its taking up room.

The captain succeeded Altamont, and was followed by Johnson. In ten hours—that is to say, about eight in the morning—the gallery was entirely open.

With the first streak of day, the Doctor was up to reconnoiter the position of the enemy. The patient animals were still occupying their old position, prowling up and down and growling. The house had already almost disappeared beneath the piled-up blocks of ice; but even while he gazed, they seemed to have determined to alter the plan of action, for suddenly all the five bears vigorously began to pull down these same heaped-up blocks.

"What are they about?" asked Hatteras.

"Well, they seem to me to be bent on demolishing their own work, and getting right down to us as fast as possible; but wait a bit, my gentlemen, we'll demolish you first."

Hastening away to the mine, he had the chamber where the powder was to be lodged enlarged the whole breadth and height of the sloping rock against which the wall leaned, till the upper part was about a foot thick, and had to be propped up to prevent its falling in. A strong stake was fixed firmly on the granite foundation, on the top of which the dead fox was fastened. A rope was attached to the lower part of the stake, sufficiently long to reach the powder stores.

"This is the bait," he said, pointing to the dead fox, "and here is the mine," he added, slowly rolling in a keg of powder containing about 100 pounds.

"But, Doctor," said Hatteras, "won't that blow us up too, as well as the bears?"

"No, we shall be too far from the scene of explosion. Besides, our house is solid, and we can soon repair the walls, even if they should get a bit shaken."

"And how do you propose to manage?" asked Altamont.

"By hauling in this rope we lower the post which props up the roof, and make it give way, and bring up the dead fox to light. I think you will agree with me that the bears are so famished with their long fasting that they won't lose much time in rushing towards their unexpected meal. Well, just at that very moment, I shall set fire to the mine, and blow up both the guests and the meal."

"Capital! Capital!" shouted Johnson, who had been listening with intense interest.

Hatteras said nothing, for he had such absolute confidence in his friend that he wanted no further explanation. But Altamont must know the why and wherefore of everything."

"But, Doctor," he said, "can you reckon on your match so exactly that you can be quite sure it will fire the mine at the right moment?"

"I don't need to reckon at all."

"Then you have a match a hundred feet long?"

"No."

"You are simply going to lay a train of powder?"

"No, that might miss fire."

"Well, there is no way then but for one of us to devote his life to the others, and go and light the powder himself.

"I'm ready," said Johnson, eagerly, "ready and willing."

"Quite useless, my brave fellow," replied the Doctor, holding out his hand. "All our lives are precious, and they will all be spared, thank God!"

"Well, I give it up!" said the American. "I'll make no more guesses."

"I should like to know what is the good of learning physics," said the Doctor, smiling, "if it can't help a man in a pinch like this. Haven't we an electric battery, and wires long enough attached to it to serve our purpose? We can fire our mine at any instant, and without the slightest danger."

"Hurrah!" exclaimed Johnson.

"Hurrah!!" echoed the others, without heeding whether the enemy heard them or not.

The Doctor's idea was immediately carried out, and the connected lines uncoiled and laid down from the house to the chamber of the mine, one end of each remaining attached to the electric battery, and the other inserted into the keg of powder.

By nine o'clock everything was ready. It was high time, for the bears were furiously engaged in the work of demolition. Johnson was stationed in the powder-magaine, in charge of the cord which held the bait.

"Now," said Clawbonny to his companions, "load your guns, in case our assailants are not killed. Stand beside Johnson, and the moment the explosion is over, rush out."

"All right," said Altamont.

"And now we have done all we can to help ourselves. So may Heaven help us!"

Hatteras, Altamont and Bell repaired to the powder-magazine, while the Doctor remained alone beside the pile. Soon he heard Johnson's voice in the distance calling out "Ready!"

"All right!" was the reply.

Johnson pulled his rope vigorously, and then rushed to the loophole to see the effect. The thin shell of ice had given way, and the body of the fox lay among the ruins. The bears were somewhat scared at first, but the next minute had eagerly rushed to seize the booty.

"Fire!" called out Johnson, and at once the electric spark was sent along the lines right into the keg of powder. A formidable explosion ensued; the house was shaken as if by an earthquake, and the walls cracked asunder. Hatteras, Altamont and Bell hurried out with the guns, but they might spare their shot, for four of the bears lay dead, and the fifth, half roasted, though alive, was scampering away in terror, as fast as his legs could carry him.

"Hurrah! Three cheers for Clawbonny," they shouted, and overwhelmed the Doctor with plaudits and thanks.

CHAPTER XIV
An Arctic Spring

THE prisoners were free, and their joy found vent in the noisiest demonstrations. They employed the rest of the day in repairing the house, which had suffered greatly by the explosion.

Next morning there was a singular rise in the temperature, the thermometer going up to 15° above zero. This comparative heat lasted several days. In sheltered spots the glass rose as high as 31°, and symptoms of a coming thaw appeared. The ice began to crack here and there, and jets of salt water were thrown up, like fountains in an English park. A few days later, the rain fell in torrents.

Thick vapor rose from the snow, giving promise of the speedy disappearance of these immense masses. The sun's pale disk became deeper in color, and remained longer above the horizon. The night was scarcely longer than three hours. Other tokens of spring's approach became manifest. The birds were returning in flocks, and the air resounded with their deafening cries. Hares were seen on the shores of the bay, and mice were in such abundance that their burrows completely honeycombed the ground.

The Doctor drew the attention of his companions to the fact that almost all these animals were beginning to lose their white winter dress, and would soon put on summer attire; and nature was already providing mosses, and poppies, and saxifrage, and short grass for their sustenance. A new world lay beneath that melting snow.

But with their inoffensive animals came back their natural enemies. Foxes and wolves arrived in search of their prey, and dismal howls broke the silence of the short night.

Arctic wolves closely resemble dogs, and their barking would deceive the most practiced ears; even the canine race themselves have been deceived by it. Indeed, it seems as if the wily animals employed this ruse to attract the dogs, and make them their prey. Several navigators have mentioned the fact, and the Doctor's own experience confirmed it. Johnson took care not to let his Greenlanders loose; of Duk there was little fear—nothing could take him in.

For about a fortnight hunting was the principal occupation. There was an abundant supply of fresh meat to be had. They shot partridges, ptarmigans, and snow ortolans, which are delicious eating. The hunters never went far from Fort Providence, for game was so plentiful that it seemed awaiting their guns, and the whole bay presented an animated appearance.

The thaw, meanwhile, was making rapid progress. The thermometer stood steadily at 32° above zero, and the water ran round the mountain-sides in cataracts, and dashed in torrents through the ravines.

The Doctor lost no time in clearing about an acre of ground, in which he sowed the seeds of anti-scorbutic plants. He just had the pleasure of seeing tiny little green leaves begin to sprout, when the cold returned in full force.

In a single night the thermometer lost nearly 40°; it went down to 8° below zero. Everything was frozen; birds, quadrupeds, amphibia disappeared as if by magic; seal-holes re-closed, and the ice once more became hard as granite.

The change was most striking; it occurred on the 18th of May, during the night. The Doctor was rather disappointed at having all his work to do again, but Hatteras bore the grievance most unphilosophically, as it interfered with all his plans of speedy departure.

"Do you think we shall have a long spell of this weather, Dr. Clawbonny?" asked Johnson.

"No, my friend, I don't; it is a last blow from the cold. You see these are his dominions, and he won't be driven out without making some resistance."

"He can defend himself pretty well," said Bell, rubbing his face.

"Yes; but I ought to have waited, and not have wasted my seed like an ignoramus; and all the more as I could, if necessary, have made them sprout by the kitchen stoves."

"But do you mean to say," asked Altamont, "that you might have anticipated the sudden change."

"Of course, and without being a wizard. I ought to have put my seed under the protection of Saint Paucratius and the two other saints, whose fête days fall this month."

The Doctor was right, for the cold lasted till the end of the month, and put an end to all their hunting expeditions. The old monotonous life indoors recommenced, and was unmarked by any incident except a serious illness which suddenly attacked Bell. This was violent quinsy, but, under the Doctor's skillful treatment, it was soon cured.

During this compulsory leisure, Clawbonny determined to have a talk with the captain on an important subject—a subject equally important to all—the build-

ing of a boat out of the planks of the *Porpoise*.

The Doctor hardly knew how to begin, as Hatteras had declared so vehemently that he would never consent to use a morsel of American wood; yet it was high time he were brought to reason, as June was at hand, the only season for distant expeditions, and they could not start without a boat.

He thought over it a long while, and at last drew the captain aside, and said, in the kindest, gentlest way:

"Hatteras, do you believe I'm your friend?"

"Most certainly I do," replied the captain, earnestly; "my best, indeed, my only friend."

"And if I give you a piece of advice without your asking, will you consider my motive is perfectly disinterested?"

"Yes, for I know you have never been actuated by self-interest. But what are you driving at?"

"Wait, Hatteras; I have one thing more to ask. Do you look on me as a true-hearted Englishman like yourself, anxious for his country's glory?"

Hatteras looked surprised, but simply said:

"I do."

"YOU desire to reach the North Pole," the Doctor went on; "and I understand and share your ambition; but to achieve your object you must employ the right means."

"Well, and have I not sacrificed everything for it?" Hatteras asked.

"No, Hatteras, you have not sacrificed your personal antipathies. Even at this very moment I know you are in the mood to refuse the indispensable conditions of reaching the Pole."

"Ah! it is the boat you want to talk about, and that man——"

"Hatteras, let us discuss the question calmly, and examine the case on all sides. The coast on which we find ourselves at present may terminate abruptly; we have no proof that it stretches right away to the Pole; indeed, if your present information proves correct, we ought to come to an open sea during the summer months.

"Well, supposing we reach this Arctic Ocean and find it free from ice and easy to navigate, what shall we do if we have no boat?"

Hatteras made no reply.

"Tell me, now, would you like to find yourself only a few miles from the Pole and not be able to get to it?"

Hatteras still said nothing, but buried his head in his hands.

"Besides," continued the Doctor, "look at the question in its moral aspect. Here is an Englishman who sacrifices his fortune, and even his life to win fresh glory for his country, but because the boat which bears him across an unknown ocean, or touches the new shore, happens to be made of the planks of an American vessel—a castaway wreck of no use to anyone—will that lessen the honor of the discovery? If you yourself had found the hull of some wrecked vessel lying deserted on the shore, would you have hesitated to make use of it; and must not a sloop built by four Englishmen and manned by four Englishmen be English from keel to gunwale?"

Hatteras was still silent.

"No," continued Clawbonny; "the real truth is, it is not the sloop you care about; it is the man."

"Yes, Doctor, yes," replied the captain. "It is this American I detest; I hate him with a thorough English hatred. Fate has thrown him in my path."

"To save you!"

"To ruin me. He seems to defy me, and speaks as if he were lord and master. He thinks he has my destiny in his hands, and knows all my projects. Didn't we see the man in his true colors when we were giving names to the different coasts? Has he ever avowed his object in coming so far north? You will never get it out of my head that this man is not the leader of some expedition sent out by the American Government."

"Well, Hatteras, suppose it is so, does it follow that his expedition is to search for the North Pole? May it not be to find the Northwest Passage? But anyway, Altamont is in complete ignorance of our object, for neither Johnson, nor Bell, nor myself, have ever breathed a word to him about it, and I am sure you have not."

"Well, let him always remain so."

"He must be told in the end, for we can't leave him here alone."

"Why not? Can't he stay here in Fort Providence?"

"He would never consent to that, Hatteras; and, moreover, to leave a man in that way, and not know whether we might find him safe when we come back, would be worse than imprudent; it would be inhuman. Altamont will come with us; he must come. But we need not disclose our projects; let us tell him nothing, but simply build a sloop for the ostensible purpose of making a survey of the coast. It seems to me it should prove to be a simple matter."

Hatteras could not bring himself to consent, but said:

"Suppose the man doesn't allow his ship to be cut up?"

"In that case, you must take the law into your own hands, and build a vessel in spite of him. There would be nothing else to do."

"I wish to goodness he would refuse, then!"

"He must be asked before he can refuse. I'll undertake the asking," said Clawbonny.

He kept his word, for that very same night at supper, he managed to turn the conversation towards the subject of making excursions during summer for hydrographical purposes.

"You will join us, I suppose, Altamont," he said.

"Of course," replied the American. "We must know how far New America extends."

Hatteras looked fixedly at his rival, but said nothing.

"And for that purpose," continued Altamont, "we had better build a little ship out of the remains of the *Porpoise*. It is the best possible use we can make of her."

"You hear, Bell," said the Doctor, eagerly. "We'll all set to work to-morrow morning."

CHAPTER XV
The Northwest Passage

NEXT morning Altamont, Bell, and the Doctor repaired to the *Porpoise*. There was no lack of wood, for, shattered as the old "three-master" had been by the icebergs, she could still supply the principal parts of a new ship, and the carpenter began his task immediately.

In the end of May the temperature again rose, and spring returned for good and all. Rain fell copiously, and before long the melting snow was running down every little slope in falls and cascades.

Hatteras could not contain his delight at these signs of a general thaw among the ice-fields, for an open sea would bring him liberty. At last he might hope to ascertain for himself whether his predecessors were correct in their assertions about a Polar basin.

This was a frequent topic of thought and conversation with him, and one evening when he was going over all the old familiar arguments in support of his theory, Altamont took up the subject, and declared his opinion that the polar basin extended west as well as east. But it was impossible for the American and the Englishman to talk long about anything without coming to words, so intensely national were both. Dr. Kane was the first bone of contention on this occasion, for the jealous Englishman was unwilling to grant his rival the glory of being a discoverer, alleging his belief that though the brave adventurer had gone far north, it was by mere chance he had made a discovery.

"Chance!" interrupted Altamont, hotly. "Do you mean to assert that it is not to Kane's energy and science that we owe his great discovery?"

"I mean to say that Dr. Kane's name is not worth mentioning in a country made illustrious by such names as Parry, and Franklin, and Ross, and Belcher, and Penny; in a country where the seas opened the Northwest Passage to an Englishman—McClure!"

"McClure!" exclaimed the American. "Well, if ever chance favored anyone it was that McClure. Do you pretend to deny it?"

"I do," said Hatteras, becoming quite excited. "It was his courage and perseverance in remaining four whole winters among the ice."

"I believe that, don't I?" said Altamont, sneeringly. "He was caught among the bergs and could not get away; but didn't he after all abandon his ship, the *Investigator,* and try to get back home? Besides, putting the man aside, what is the value of his discovery? I maintain that the Northwest Passage is still undiscovered, for not a single ship to this day has ever sailed from Bering Strait to Baffin Bay!"

The fact was indisputable, but Hatteras started to his feet, and said:

"I will not permit the honor of an English captain to be attacked in my presence any longer!"

"You will not permit!" echoed Altamont, also springing erect. "But these are facts, and it is out of your power to destroy them!"

"Sir!" shouted Hatteras, pale with rage.

"My friends!" interposed the Doctor; "pray be calm. This is a scientific point that we are discussing."

But Hatteras was deaf to reason now, and said angrily:

"I'll tell you the facts, sir."

"And I'll tell you," retorted the irate American.

"Gentlemen," said Clawbonny, in a firm tone, "allow me to speak, for I know the facts of the case as well as and perhaps better than you, and I can state them impartially."

"Yes, yes!" cried Bell and Johnson, who had been anxiously watching the strife.

"Well, go on," said Altamont, finding himself in the minority, while Hatteras simply made a sign of acquiescence, and resumed his seat.

The Doctor brought a chart and spread it out on the table, that his auditors might follow his narration intelligibly, and be able to judge the merits of McClure for themselves.

"It was in 1848," he said, "that two vessels, the *Herald* and the *Plover*, were sent out in search of Franklin, but their efforts proving ineffectual, two others were despatched to assist them—the *Investigator,* in command of McClure, and the *Enterprise,* in command of Captain Collinson. The *Investigator* arrived first in Bering Strait, and without waiting for her consort, set out with the declared purpose to find Franklin or the Northwest Passage. The gallant young officer hoped to push north as far as Melville Sound, but just at the extremity of the Strait he was stopped by an insurmountable barrier of ice and forced to winter there. During the long, dreary months, however, he and his officers undertook a journey over the ice-field to make sure of its communicating with Melville Sound."

"Yes, but he did not get through," said Altamont.

"Stop a bit," replied Clawbonny; "as soon as a thaw set in, McClure renewed his attempt to bring his ship into Melville Sound, and had succeeded in getting within twenty miles, when contrary winds set in, and dragged her south with irresistible violence. This decided the captain to alter his course. He determined to go in a westerly direction; but after a fearful struggle with icebergs, he stuck fast in the first of the series of straits which end in Baffin Bay, and was obliged to winter in Mercy Bay. His provisions would only hold out eighteen months longer, but he would not give up. He set out on a sled, and reached Melville Island, hoping to fall in with some ship or other, but all he found in Winter Harbor was a cairn, which contained a document, stating that Captain Austin's lieutenant, McClintock, had been there the preceding year. McClure replaced this document by another, which stated his intention of returning to England by the Northwest Passage he had discovered, by Lancaster Sound and Baffin Bay, and that in the event of his not being heard of, he might be looked for north or west of Melville Island. Then he went back to Mercy Bay with undaunted courage, to pass a third winter. By the beginning of March his stock of provisions was so reduced, in consequence of the utter scarcity of game, through the severity of the season, that McClure resolved to send half his men

to England, either by Baffin Bay or by McKenzie River and Hudson Bay. The other half would manage to work the vessel to Europe. He kept all his best sailors, and selected for departure only those to whom a fourth winter would have been fatal. Everything was arranged for their leaving, and the day fixed, when McClure, who was out walking with Lieutenant Craswell, observed a man running towards them, flinging up his arms and gesticulating frantically, and on getting nearer recognized him as Lieutenant Prim, officer on board the *Herald,* one of the ships he had parted with in Bering Strait two years before. Captain Kellett, the Commander, had reached Winter Harbor, and finding McClure's document in the cairn, had dispatched his lieutenant in search of him. McClure accompanied him back, and arranged with the captain to send him his batch of invalids. Lieutenant Craswell took charge of these and conveyed them safely to Winter Harbor. Leaving them there he went across the ice four hundred and seventy miles, and arrived at Beechey Island, where, a few days afterwards, he took passage with twelve men on board the *Phoenix,* and reached London safely on the 7th of October, 1853, having traversed the whole extent between Bering Strait and Cape Farewell."

"Well, if arriving on one side and leaving at the other is not going through, I don't know what is!"

"Yes, but he went four hundred and seventy miles over ice-fields," objected Altamont.

"What of that?"

"Everything; that is the gist of the whole argument. It was not the *Investigator* that went through."

"No," replied Clawbonny, "for, at the close of the fourth winter, McClure was obliged to leave her among the ice."

"Well, in maritime expeditions the vessel has to get through, and not the man; and if ever the Northwest Passage is practicable, it will be for ships and not sledges. If a ship cannot go, a sloop must."

"A sloop!" exclaimed Hatteras, discovering a hidden meaning in the words.

"Altamont," said the Doctor, "your distinction is simply puerile, and in that respect we all consider that you are in the wrong."

"You may easily do that," returned the American. "It is four against one, but that will not prevent me from holding my own opinion."

"Keep it and welcome, but keep it to yourself, if you please, for the future," exclaimed Hatteras.

"And pray what right have you to speak to me like this, sir?" shouted Altamont, in a fury.

"My right as captain," returned Hatteras, equally angry.

"Am I to submit to your orders, then?"

"Most assuredly, and woe to you if—"

The Doctor did not allow him to proceed, for he really feared the two antagonists might come to blows. Bell and Johnson seconded his endeavors to make peace, and, after a few conciliatory words, Altamont turned on his heel, and walked carelessly away, whistling "Yankee Doodle." Hatteras went outside and paced up and down with rapid strides. In about an hour he came back, and retired to bed without saying another word.

CHAPTER XVI
Arctic Arcadia

ON the 29th of May, for the first time, the sun never set. His glowing disk just touched the boundary line of the horizon, and rose again immediately. The period was now entered when the day lasts twenty-four hours.

Next morning there was a magnificent halo; the monarch of day appeared surrounded by a luminous circle radiant with all the prismatic colors. This phenomenon never lost its charm for the Doctor, however frequently it occurred, and he always noted carefully all particulars respecting it.

Before long the feathered tribes began to return, filling the air with their discordant cries. The Doctor shot several, and among them one or two cranes and a solitary stork.

The snow was now fast melting, and the ice-fields were covered with "slush." All round the bay large pools had formed, between which the soil appeared as if it was some product of spring.

The Doctor recommenced his sowing, for he had plenty of seed; but he was surprised to find sorrel growing already between the half-dried stones, and even pale sickly heaths, trying to show their delicate pink blossoms.

At last it began to be really hot weather. On the 15th of June the thermometer stood at 57° above zero. The Doctor scarcely believed his eyes, but it was a positive fact, and it was soon confirmed by the changed appearance of the country.

An excursion was made to Johnson's Island, but it turned out to be a barren little islet of no importance whatever, though it gave the old boatswain infinite pleasure to know those sea-girt rocks bore his name.

There was some danger of both house and stores melting, but happily, this high temperature proved exceptional, the thermometer seldom averaging much above freezing-point.

By the middle of June the sloop had made good progress, and already presented a shapely appearance. As Bell and Johnson took the work of construction entirely on themselves, the others went hunting, and succeeded in killing several deer. Altamont adopted the Indian practice of crawling on all-fours and adjusting his gun and arms so as to simulate horns and deceive the timid animal, till he could get near enough to take good aim.

Their principal object of pursuit, however, was the musk-ox, which Parry had met with in such numbers in Melville Island; but not a solitary specimen was to be seen anywhere about Victoria Bay, and a distant excursion was resolved upon.

The three hunters, accompanied by Duk, set out on Monday, the 17th of June, at six in the morning, each man armed with a double-barreled gun, a hatchet and snow-knife, and provisions for several days.

It was a fine bright morning, and by ten o'clock they had gone twelve miles; but saw not a living thing.

However, they went on in hope, after a good breakfast and half-an-hour's rest.

The ground was getting gradually lower, and presented a peculiar appearance from the snow, which lay here and there in ridges unmelted. At a distance it looked like the sea when a strong wind is lashing up the waves, and cresting them with a white foam.

Before long they reached a sort of glen, at the bottom of which was a winding river. It was almost completely thawed, and already the banks were clothed with a species of vegetation, as if the sun had done his best to fertilize the soil.

"I tell you what," said the Doctor, "a few enterprising colonists might make a fine settlement here. With a little industry and perseverance wonders might be done in this country. Ah! if I am not much mistaken, it has some four-footed inhabitants already. Those frisky little fellows know the best spots to choose."

"Hares! I declare. That's jolly!" said Altamont, loading his gun.

"Stop!" cried the Doctor; "stop, you furious hunter. Let the poor little things alone; they are not thinking of running away. Look, they are actually coming to us."

He was right, for presently three or four young hares, gamboling away among the fresh moss and tiny heaths, came running about their legs so fearlessly and trustfully, that even Altamont was disarmed. They rubbed against the Doctor's knees, and let him stroke them till the kind-hearted man could not help saying to Altamont:

"Why give shot to those who come for caresses? The death of these little beasts could do us no good."

"You say what's true, Clawbonny. Let them live!" replied Hatteras.

"And these ptarmigans too, I suppose, and these long-legged plovers," added Altamont, as a whole covey of birds flew down among the hunters, never suspecting their danger.

Duk could not tell what to make of it, and stood there stupefied.

It was a strange and touching spectacle to see the pretty creatures; they flew on Clawbonny's shoulders, and lay down at his feet as if inviting friendly caresses, and doing their utmost to welcome the strangers. The whole glen echoed with their joyous cries as they darted to and fro from all parts. The good Doctor seemed some mighty enchanter.

The hunters had continued their course along the banks of the river, when a sudden bend in the valley revealed a herd of deer, eight or ten in number, peacefully browsing on some lichens that lay half-buried in the snow. They were charming creatures, so graceful and gentle, male and female, both adorned with noble antlers, wide-spreading and deeply-notched. Their skin had already lost its winter whiteness, and began to assume the brown tint of summer. Strange to say, they appeared not a whit more afraid than the birds or hares.

The three men were now right in the center of the herd, but not one made the least movement to run away. This time the worthy Doctor had far more difficulty in restraining Altamont's impatience, for the mere sight of such magnificent animals roused his hunting instincts, and he became quite excited; while Hatteras, on the contrary, seemed really touched to see the splendid creatures rubbing their heads so affectionately and trustfully against the good Clawbonny, the friend of every living thing.

"But, I say," exclaimed Altamont, "didn't we come out expressly to hunt?"

"To hunt the musk-ox, and nothing else," replied Clawbonny. "Besides, we shouldn't know what to do with this game, even if we killed it; we have provisions enough. Let us for once enjoy the sight of men and animals in perfect amity."

"It proves no human beings have been here before," said Hatteras.

"True, and that proves something more; these animals are not of American origin."

"How do you make that out?" said Altamont.

"Why, if they had been born in North America, they would have known how to treat that mammiferous biped called man, and would have fled at the first glimpse of us. No, they are from the north, most likely from the untrodden wilds of Asia; so, Altamont, you have no right to claim them as fellow countrymen."

"Oh! a hunter doesn't examine his game so closely as all that. Everything is grist that comes to his mill."

"All right. Calm yourself, my brave Nimrod! For my own part, I would rather never fire another shot than make one of these beautiful creatures afraid of me. See, even Duk fraternizes with them. Believe me, it is well to be kind where we can. Kindness is power."

"Well, well, so be it," said Altamont, not at all understanding such scruples. "But I should like to see what you would do if you had no weapon but kindness among a pack of bears or wolves! You wouldn't make much of it."

"I make no pretensions to charm wild beasts. I don't believe much in Orpheus and his enchantments. Besides, bears and wolves would not come to us like these hares, and partridges, and deer."

"Why not? They have never seen human beings either."

"No, but they are savage by nature," said Clawbonny, "and ferocity, like wickedness, engenders suspicion. This is true of men as well as animals."

They spent the whole day in the glen, which the Doctor christened "Arctic Arcadia," and when evening came they lay down to rest in the hollow of a rock, which seemed to have been expressly prepared for their accommodation.

CHAPTER XVII

Altamont's Revenge

NEXT morning, as the fine weather still continued, the hunters determined to have another search for the musk-ox. It was only fair to give Altamont a chance with the distinct understanding that he should have the right of firing, however fascinating the game they might meet. Besides, the flesh of the musk-ox, though a little too highly impreg-

nated with the smell, is savory food, and the hunters would gladly carry back a few pounds of it to Fort Providence.

During the first part of the day, nothing occurred worth mentioning, but they noticed a considerable change in the aspect of the country, and appearances seemed to indicate that they were approaching a hilly region. This New America was evidently either a continent or an island of considerable extent.

Duk was running far ahead of his party when he stopped suddenly short, and began sniffing the ground as if he had caught scent of game. Next minute he rushed forward again with extreme rapidity, and was speedily out of sight. But loud distinct barking convinced the hunters that the faithful fellow had at last discovered the desired object.

They hurried onwards and after an hour and a half's quick walking, found him standing in front of two formidable-looking animals, and barking furiously. The Doctor recognized them at once as belonging to the musk-ox, or *Ovibos* genus, as naturalists call it, by the very wide horns touching each other at their base, by the absence of muzzle, by the narrow, square forehead, resembling that of a sheep, and by the very short tail. Their hair was long and thickly-matted, and mixed with fine brown, silky wool.

These singular-looking quadrupeds were not the least afraid of Duk, though extremely surprised; but at the first glimpse of the hunters they took flight, and it was no easy task to go after them, for half an hour's swift running brought them no nearer, and left the whole party so out of breath, that they were forced to come to a halt.

"Confound the beasts!" said Altamont.

"Yes, Altamont, I'll make them over to you," replied Clawbonny; "they are true Americans, and they don't appear to have a very favorable idea of their fellow-countrymen."

"That proves our hunting prowess," rejoined Altamont.

Meantime the oxen finding themselves no longer pursued, had stopped short. Further pursuit was evidently useless. If they were to be captured at all they must be surrounded, and the plateau which they first happened to have reached, was very favorable for the purpose. Leaving Duk to worry them, they went down by the neighboring ravines, and got to one end of the plateau, where Altamont and the Doctor hid themselves behind projecting rocks, while Hatteras went on to the other end, intending to startle the animals by his sudden appearance, and drive them back towards his companions.

"I suppose you have no objection this time to bestow a few bullets on these gentry?" said Altamont.

"Oh, no, it is 'a fair field now, and no favor,'" returned Clawbonny.

The oxen had begun to shake themselves impatiently at Duk, trying to kick him off, when Hatteras started up right in front of them, shouting and chasing them back. This was the signal for Altamont and the Doctor to rush forward and fire, but at the sight of two assailants, the terrified animals wheeled round and attacked Hatteras. He met their onset with a firm, steady foot, and fired straight at their heads. But both his balls were powerless, and only served still further to madden the enraged beasts. They rushed upon the unfortunate man like furies, and threw him on the ground in an instant.

"He is a dead man!" exclaimed the Doctor, in despairing accents.

A tremendous struggle was going on in Altamont's breast at the sight of his prostrate foe, and though his first impulse was to hasten to his help, he stopped short, battling with himself and his prejudices. But his hesitation scarcely lasted half a second. His better self conquered, and he rushed forward with Clawbonny.

Hatteras full well understood how his rival felt, but would rather have died than have begged his intervention. However, he had hardly time to think about it, before Altamont was at his side.

He could not have held out much longer, for it was impossible to ward off the blows of horns and hoofs of two such powerful antagonists, and in a few minutes more he must have been torn to pieces. But suddenly two shots resounded, and Hatteras felt the balls graze his head.

"Courage!" shouted Altamont, flinging away his discharged weapon, and throwing himself right in front of the raging animals. One of them, shot to the heart, fell dead as he reached the spot, while the other dashed madly on Hatteras, and was about to gore the unfortunate captain with his horns, when Altamont plunged his snow knife far into the beast's wide open jaws with one hand, and with the other dealt him such a tremendous blow on the head with his hatchet, that the skull was completely split open.

It was done so quickly that it seemed like a flash of lightning, and all was over. The second ox lay dead, and Clawbonny shouted, "Hurrah! hurrah!"

Hatteras was saved.

He owed his life to the man he hated the most. What a storm of conflicting passions this must have roused in his soul! But where was the emotion he could not master?

However, his action was prompt, whatever his feeling might be. Without a moment's hesitancy, he went up to his rival, and said in a grave voice:

"Altamont, you have saved my life!"

"You saved mine," replied the American.

There was a moment's silence, and then Altamont added:

"We're quits, Hatteras."

"No, Altamont," said the captain; "when the Doctor dragged you out of your icy tomb, I did not know who you were; but you saved me at the peril of your own life, knowing quite well who I was."

"Why, you are a fellow-creature at any rate, and whatever faults an American may have, he is no coward," Altamont said.

"No, indeed," said the Doctor. "He is a man, every inch as much as yourself, Hatteras."

"And, like me, he shall have part in the glory that awaits us."

"The glory of reaching the North Pole?" said Alta-

mont. "I can share your glory in this discovery?"

"Yes," replied Hatteras, proudly.

"I guessed right then," said Altamont. "And you have actually dared to conceive such a project. Oh! it is grand; I tell you it is sublime even to think of it!"

"But tell me" said Hatteras in a hurried manner; "you were not bound for the Pole then yourself?"

Altamont hesitated.

"Come, speak out, man," urged the Doctor.

"Well, to tell the truth, I was not, and the truth is better than self-love. No, I had no such grand purpose in view. I was trying to find the Northwest Passage, and that was all. I would never have dreamed of such a stupendous undertaking."

"Altamont," said Hatteras, holding out his hand; "be our companion to glory; come with us and find the North Pole."

The two men clasped hands in a warm, hearty grasp, and a strong bond of friendship between them was sealed.

When they turned to look for the Doctor they found him in tears. "Ah! friends," he said, wiping his eyes; "you have made me so happy, it is almost more than I can bear! You have sacrificed this miserable nationality for the sake of the common cause. You have said, 'What does it matter, if only the Pole is discovered, whether it is by an Englishman or an American?' Why should we brag of being American or English, when we can boast that we are men? It is an infinitely more worthwhile boast."

The good little man was beside himself with joy. He hugged the reconciled enemies to his bosom, and cemented their newly found friendship by his own affection to both.

At last he grew calm, after at least a twentieth embrace, and said:

"It is time I went to work now. Since I am no hunter, I must use my talents in another direction."

And he began to cut up the oxen so skillfully, that he seemed like a surgeon making a delicate autopsy.

His two companions looked on, smiling. In a few minutes the adroit operator had cut off more than a hundred pounds of flesh. This he divided into three parts. Each man took one, and they retraced their steps to Fort Providence.

At ten o'clock they arrived at Doctor's House, where Johnson and Bell had a good supper prepared for them.

But before sitting down to enjoy it, the Doctor exclaimed in a jubilant tone, and pointing to his two companions, said:

"My dear old Johnson, I took out an American and an Englishman with me, didn't I?"

"Yes, Dr. Clawbonny."

"Well, I bring back two brothers."

This was joyous news to the sailors, and they shook hands warmly with Altamont; while the Doctor recounted all that had passed, and how the American captain had saved the English captain's life.

That night no five happier men could have been found anywhere than those five who lay sleeping in the little snow-house.

CHAPTER XVIII
Final Preparations

NEXT day the weather changed and the cold returned. Snow, rain, and tempest came in quick succession for several days.

Bell had completed the sloop, and done his work well, for the little vessel was admirably adapted for the purpose contemplated, being high at the sides and partly decked, so as to be able to stand a heavy sea, and yet light enough to be drawn on the sledge without overburdening the dogs.

At last a change of the greatest importance took place. The ice began to tremble in the center of the bay, and the highest masses became loosened at their base ready to form icebergs, and drift away before the first gale; but Hatteras would not wait for the ice-fields to break up before he started. Since the journey must be made on land, he did not care whether the sea was open or not; and the day of departure was fixed for the 25th of June—Johnson and Bell undertaking the necessary repairs of the sled.

On the 20th, finding there was space enough between the broken ice to allow the sloop to get through, it was determined to take her on a trial trip to Cape Washington. The sea was not quite open, but it would have been impossible to go across on foot.

This short sail of six hours sufficiently tested the powers of the sloop, and proved her excellent qualities. In coming back they witnessed a curious sight; it was the chase of a seal by a gigantic bear. Mr. Bruin was too busily engaged to notice the vessel, or he would have pursued them; he was intently watching beside a seal-hole with the patience of a true hunter, or rather angler, for he was certainly fishing just then.

But all of a sudden there was a slight disturbance on the surface of the water in the hole, which announced the coming up of the amphibious animal. Instantly the bear lay flat on his belly, his two paws stretched round the opening.

Next minute up came the seal, but his head no sooner appeared above the water than the bear's paws closed about him like a vise, and dragged him right out. The poor seal struggled desperately, but could not free himself from the iron grasp of his enemy, who hugged him closer and closer, till suffocation was complete. Then he carried him off to his den as if the weight were nothing, leaping lightly from pack to pack till he gained *terra firma* safely.

On the 22nd of June, Hatteras began to load the sled. They put in 200 lbs. of salt meat, three cases of vegetables and preserved meat, besides lime-juice, and flour, and medicine. They also took 200 lbs. of powder and a stock of fire-arms. Including the sloop and the Halkett-boat, there was about 1,500 lbs. weight, a heavy load for four dogs, and all the more as they would have to drag it every day, instead of only four days successively, like the dogs employed by the Esquimaux, who always keep a relay for their sleds. However, the distance to the Pole was not 350 miles at the outside, and they did not intend to go more than twelve miles a day, as they could do it comfortably in a month.

Even if land failed them, they could always fall back on the sloop, and finish the journey without fatigue to men or dogs.

All the party were in excellent health, though they had lost flesh a little; but, by attending to the Doctor's wise counsel, they had weathered the winter without being attacked by any of the maladies incident to the climate.

Now, they were almost at their journey's end, and no one doubted of success, for a common bond of sympathy bound fast the five men, and made them strong to persevere. On Sunday, the 23rd, all was ready, and it was resolved to devote the entire day to rest.

The dwellers on Fort Providence could not see the last day dawn without some emotion. It cost them a pang to leave the snow-hut which had served them in such good stead, and this hospitable shore where they had passed the winter. Take it altogether, they had spent very happy hours there, and the Doctor made a touching reference to the subject as they sat round the table at the evening meal.

They retired early to rest, for they needed to be up betimes. So passed the last night at Fort Providence.

CHAPTER XIX
March to the North

NEXT day at early dawn, Hatteras gave the signal for departure. The well-fed and well-rested dogs were harnessed to the sled. They had been having a good time of it all the winter, and might be expected to do good service during the summer.

It was at six in the morning when the expedition started. After following the windings of the bay and going past Cape Washington, they struck into the direct route for the north, and by seven o'clock had lost sight of the lighthouse and Fort Providence.

During the first two days they made twenty miles in twelve hours, devoting the remainder of the time to rest and meals. The tent was quite sufficient protection during sleep.

The temperature began to rise. In many places the snow melted entirely away, and great patches of water appeared; here and there complete ponds, which a little stretch of imagination might easily convert into lakes. The travelers were often up to their knees, but they only laughed over it: and, indeed, the Doctor was rather glad of such unexpected baths.

"But for all that," he said, "the water has no business to wet us here. It is an element which has no right in this country, except in a solid or vaporous state. Ice or vapor is all very well, but water—never!"

Hunting was not forgotten during the march, for fresh meat was a necessity. Altamont and Bell kept their guns loaded, and shot ptarmigans, guillemots, geese, and a few young hares; but, by degrees, birds and animals had been changing from trustfulness to fear, and had become so shy and difficult to approach, that very often, but for Duk, the hunters would have wasted their powder.

Hatteras advised them not to go more than a mile away, as there was not a day, nor even an hour, to lose, for three months of fine weather was the utmost they could count upon. Besides, the sled was often coming to difficult places, when each man was needed to lend a helping hand.

On the third day they came to a lake, several acres in extent, and still entirely frozen over. The sun's rays had little access to it, owing to its situation, and the ice was so strong that it must have dated from some remote winter. It was strong enough to bear both the travelers and their sled, and was covered with dry snow.

From this point the country became gradually lower, from which the Doctor concluded that this New America did not extend to the Pole, but was most probably an island.

Up to this time the expedition had been attended with no fatigue. The travelers had only suffered from the intense glare of the sun on the snow, which threatened them with snow-blindness. At another time of the year they might have avoided this by walking during the night, but at present there was no night at all. Happily the snow was beginning to melt, and the brilliancy would diminish as the process of dissolution advanced.

On the 8th of June the thermometer rose to 45° and the rain fell in torrents. Hatteras and his companions, however, marched stoically on, and even hailed the downpour with delight, knowing that it would hasten the disappearance of the snow.

As they went along the Doctor often picked up stones, both round ones and flat pebbles, as if worn away by the tide. He thought from this they must be near the Polar Basin, and yet far as the eye could reach was one interminable plain.

There was not a trace of houses, or huts, or cairns visible. It was evident that the Greenlanders had not pushed their way so far north, and yet the famished tribes would have found their account in coming, for the country abounded in game.

On the 29th Bell killed a fox, and Altamont a musk-ox. These supplies of fresh food were very acceptable, and even the Doctor surveyed, with considerable satisfaction, the haunches of meat they managed to procure from time to time.

"Don't let us stint ourselves," he used to say on these occasions; "food is no unimportant matter in expeditions like ours."

"Especially," said Johnson, "when a meal depends on a lucky shot."

"You're right, Johnson; a man does not think so much about dinner when he knows the soup-pot is simmering by the kitchen-fire."

On the 30th, they came to a district which seemed to have been upturned by some volcanic convulsion, so covered was it with cones and sharp lofty peaks. A strong breeze from the southeast was blowing, which soon increased to a hurricane, sweeping over the rocks covered with snow and the huge masses of ice, which took the forms of icebergs and hummocks, though on dry land.

The tempest was followed by damp, warm weather, which caused a regular thaw. On all sides nothing

could be heard but the noise of cracking ice and falling avalanches. The travelers had to be very careful in avoiding hills, and even in speaking aloud, for the slightest agitation in the air might have caused a catastrophe. Indeed, the suddenness is the peculiar feature in Arctic avalanches, distinguishing them from those of Switzerland and Norway. Often the dislodgment of a block of ice is instantaneous, and not even a cannon-ball or thunderbolt could be more rapid in its descent. The loosening, the fall, and the crash happen almost simultaneously.

Happily, however, no accident befell any of the party, and three days afterwards they came to smooth, level ground again. But here a new phenomenon met their gaze—a phenomenon which was long a subject of patient inquiry among the learned of both hemispheres. They came to a long chain of low hills which seemed to extend for miles, and were all covered on the eastern side with bright red snow.

It is easy to imagine the surprise and half-terrified exclamation of the little company at the sight of this long red curtain; but the Doctor hastened to reassure them, or rather to instruct them, as to the nature of this peculiar snow. He told them that this same red substance had been found in Switzerland, in the heart of the Alps, and that the color proceeded solely from the presence of certain corpuscles, about the nature of which for a long time chemists could not agree. They could not decide whether these corpuscles were of animal or vegetable origin, but at last it was settled that they belonged to the family of fungi, being a sort of microscopic mushroom of the species *Uredo*.

Piercing the snow over with his iron-tipped staff, the Doctor found that the coloring matter extended to a depth of nine feet. He pointed this out to his companions, that they might have some idea of the enormous number of these tiny mushrooms in a layer extending so many miles.

This phenomenon was none the less strange for being explained, for red is a color seldom seen in nature over any considerable area. The reflection of the sun's rays upon it produced the most peculiar effect, lighting up men and animals, and rocks with a fiery glow, as if proceeding from some flame within. When the snow melted it looked like blood, as the red particles do not decompose. It seemed to the travelers as if rivulets of blood were running among their feet.

The Doctor filled several bottles with this precious substance to examine at leisure, as he had had only a passing glimpse of the Crimson Cliffs in Baffin Bay.

This Field of Blood, as he called it, took three hours to get over, and then the country resumed its usual aspect.

CHAPTER XX

Footprints in the Snow

ON the fourth of July there was such an exceedingly dense fog, that it was very difficult to keep the straight course for the north. No misadventure, however, befell the party during the darkness, except the loss of Bell's snow-shoes. At Bell's suggestion, which fired the Doctor's inventive genius, torches were contrived, made of tow steeped in spirits-of-wine and fastened on the end of a stick, and these served somewhat to help them on, though they made but small progress; for, on the sixth day, after the fog had cleared off, the Doctor took their bearings, and found that they had only been marching at the rate of eight miles a day.

Determined to make up for lost time, they rose next morning very early and started off, Bell and Altamont as usual going ahead of the rest and acting as scouts. Johnson and the others kept beside the sled, and were soon nearly two miles behind the guides; but the weather was so dry and clear that all their movements could be distinctly observed.

"What now?" said Clawbonny, as he saw them make a sudden halt, and stoop down as if examining the ground.

"I was just wondering what they are about, myself," replied old Johnson.

"Perhaps they have come on the tracks of animals," suggested Hatteras.

"No," said Clawbonny, "it can't be that."

"Why not?"

"Because Duk would bark."

"Well, it is quite evident they are examining some sort of marks."

"Let's go on, then," said Hatteras; and, urging forward the dogs, they rejoined their companions in about twenty minutes, and shared their surprise at finding unmistakable fresh footprints of human beings in the snow.

"They are Esquimaux footprints," said Hatteras.

"Do you think so?" asked Altamont.

"There is no doubt of it."

"But what do you make of this, then?" returned Altamont, pointing to another footmark repeated in several places. "Do you believe for a minute that was made by an Esquimau?"

It was incontestably the print of a European boot—nails, sole, and heel clearly stamped in the snow. There was no room for doubt, and Hatteras exclaimed in amazement; "Europeans here!"

"Evidently," said Johnson.

"And yet it is so improbable that we must take a second look before pronouncing an opinion," said Clawbonny.

But the longer he looked the more apparent became the fact. Hatteras was chagrined beyond measure. "A European here, so near the Pole!"

The footprints extended for about a quarter of a mile, and then diverged to the west. Should the travelers follow them farther?

"No," said Hatteras, "let us go on."

He was interrupted by an exclamation from the Doctor, who had just picked up an object that gave still more convincing proof of European origin. It was a part of a pocket spy-glass!

"Well, if we still had any doubts about the footmarks, this settles the case at once," said Clawbonny.

"Forward!" exclaimed Hatteras so energetically that instinctively each one obeyed, and the march was resumed forthwith. The day wore away, but no further

sign of the presence of any rivals was discovered, and they prepared to encamp for the night. The tent was pitched in a ravine for shelter, as the sky was dark and threatening, and a violent north wind was blowing.

"I'm afraid we'll have a bad night," said Johnson.

"A pretty noisy one, I expect," replied the Doctor, "but not cold. We had better take every precaution, and fasten our tent with good big stones."

"You are right, Dr. Clawbonny. If the hurricane swept away our tent, I don't know where we should find it again."

The tent held fast, but sleep was impossible, for the tempest was let loose and raged with tremendous violence during the night.

"It seems to me," said the Doctor, during a brief lull in the deafening roar, "as if I could hear the sound of collisions between icebergs and ice-fields. If we were near the sea, I could really believe there was a general breaking-up in the ice."

"I can't explain the noises any other way," said Johnson.

"Can we have reached the coast, I wonder?" asked Hatteras.

"It is not impossible," replied Clawbonny. "Listen! Do you hear that crash? That is certainly the sound of icebergs falling. We surely cannot be very far from the ocean."

"Well, if it turns out to be so, I shall push right on over the ice-fields."

"Oh, they'll be all broken up after such a storm as this. We shall see what to-morrow brings; but all I can say is, if any poor fellows are wandering about in a night like this, I pity them."

The storm lasted for ten hours, and the weary travelers anxiously watched for the morning. About daybreak its fury seemed to have spent itself, and Hatteras, accompanied by Bell and Altamont, ventured to leave the tent. They climbed a hill about three hundred feet high, which commanded a wide view. But what a metamorphosed region met their gaze! All the ice had completely vanished, the storm had chased away the winter, and stripped the soil everywhere of its snow covering.

But Hatteras scarcely bestowed a glance on surrounding objects; his eager gaze was bent on the northern horizon, which appeared shrouded in black mist.

"That may very likely be caused by the ocean," suggested Clawbonny.

"You are right. The sea must be there," was the reply.

"That tint is what we call the *blink* of open water," said Johnson.

"Come on, then, to the sled at once, and let us get to this unknown ocean," exclaimed Hatteras.

Their few preparations were soon made, and the march resumed. Three hours afterwards they arrived at the coast, and shouted simultaneously, "The sea! the sea!"

"Ay, and open sea!" added Hatteras.

And so it was. The storm had opened wide the Polar Basin, and loosened packs were drifting in all directions.

The icebergs had weighed anchor, and were sailing out into the open sea. This new ocean stretched out of sight, and not a single island or continent was visible.

On the east and west the coast formed two capes or headlands, which sloped gently down to the sea. In the center, a projecting rock formed a small natural bay, sheltered on three sides, into which a wide river fell, bearing in its bosom the melted snows of winter.

After a careful survey of the coast, Hatteras determined to launch the sloop that very day, and to unpack the sled and get everything on board. The tent was soon put up, and a comfortable repast prepared. This important business despatched, work commenced; and all hands were so expeditious and willing, that by five o'clock nothing more remained to be done. The sloop lay rocking gracefully in the little bay, and all the cargo was on board the boat except the tent, and what was required for the night's encampment.

The sight of the sloop suggested to Clawbonny the propriety of giving Altamont's name to the little bay. His proposition to that effect met with unanimous approval, and the port was forthwith dignified by the title of Altamont Harbor.

According to the Doctor's calculations, the travelers were now only 3° distant from the Pole. They had gone over two hundred miles from Victoria Bay to Altamont Harbor, and were in latitude 87° 5′ and 118° 35′.

CHAPTER XXI

The Open Sea

NEXT morning by eight o'clock all the remaining effects were on board, and the preparations for departure completed. But before starting, the Doctor thought he would like to take a last look at the country and see if any further traces of the presence of strangers could be discovered, for the mysterious footmarks they had met with were never out of his thoughts. He climbed to the top of a height which commanded a view of the whole southern horizon, and took out his pocket-telescope. But what was his astonishment to find he could see nothing through it, not even neighboring objects. He rubbed his eyes and looked again, but with no better result. Then he began to examine the telescope. The object-glass was gone!

The object-glass! This explained the whole mystery, footprints and all; and with a shout of surprise he hurried down the hill to impart his discovery to the wondering companions, who came running towards him, startled by his loud exclamation, and full of anxiety at his precipitate descent.

"Well, what is the matter now?" said Johnson.

The Doctor could hardly speak, he was so out of breath. At last he managed to gasp out:

"The tracks, footmarks, strangers."

"What?" said Hatteras, "strangers here?"

"No, no, the object-glass; the object-glass out of my telescope."

And he held out his spy-glass for them to look at.

"Ah! I see," said Altamont, "it is wanting."

"Yes."

"But then the footmarks."

"They were ours, friends, just ours," exclaimed the Doctor. "We had lost ourselves in the fog, and had been wandering in a circle."

"But the boot marks," objected Hatteras.

"Bell's. He walked about a whole day after he had lost his snow shoes."

"So I did," said Bell. The mistake was so evident that they all laughed heartily, except Hatteras, though no one was more glad than he at the discovery.

A quarter of an hour afterwards the little sloop sailed out of Altamont Harbor, and commenced her voyage of discovery. The wind was favorable, but there was little of it, and the weather was positively warm.

The sloop was none the worse for the sled journey. She was in first-rate trim, and easily managed. Johnson steered, the Doctor, Bell, and the American leaned back against the cargo, and Hatteras stood at the prow, his fixed, eager gaze bent steadily on that mysterious point towards which he felt drawn with irresistible power, like the magnetic needle, to the Pole. He wished to be the first to descry any shore that might come in sight, and he had every right to the honor.

The water of this Polar Sea presented some peculiar features worth mentioning. In color it was a faint ultra-marine blue, and possessed such a wonderful transparency that one seemed to gaze down into fathomless depths. These depths were lighted up, no doubt, by some electrical phenomenon, and so many varieties of living creatures were visible that the vessel seemed to be sailing over a vast aquarium.

Innumerable flocks of birds were flying over the surface of this marvelous ocean, darkening the sky like thick heavy storm-clouds. Water-fowl of every description were among them, from the albatross to the penguin, and all of gigantic proportions. Their cries were absolutely deafening, and some of them had such immense, wide-spreading wings, that they covered the sloop completely as they flew over. The Doctor thought himself a good naturalist, but he found his science greatly at fault, for many a species here was wholly unknown to any ornithological society.

The good little man was equally nonplussed when he looked at the water, for he saw the most wonderful medusæ, some so large that they looked like little islands floating about among Brobdingnagian sea-weeds. And below the surface, what a spectacle met the eye! Myriads of fish of every species; young seals at play with each other; narwhals with their one strong weapon of defense, like the horn of a unicorn, chasing the timid seals; whales of every tribe, spouting out columns of water, and filling the air with a peculiar whizzing noise; dolphins, seals, and walruses, quietly browsing on submarine pastures; and the Doctor could gaze at them all as easily and clearly as if they were in glass tanks in the Zoological Gardens.

There was a strange supernatural purity about the atmosphere. It seemed charged to overflowing with oxygen, and had a marvelous power of exhilaration, producing an almost intoxicating effect on the brain.

Towards evening Hatteras and his companions lost sight of the coast. Night came on, though the sun remained just above the horizon; it had the same influence on animated nature as in temperate zones. Birds, fish, and all the cetacea disappeared, and perfect silence prevailed.

Since the departure from Altamont Harbor, the sloop had made one degree farther north. The next day brought no signs of land; there was not even a speck on the horizon. The wind was still favorable, and the sea pretty calm. The birds and fishes returned as numerously as on the preceding day, and the Doctor, leaning over the side of the vessel, could see the whales and the dolphins, and all the rest of the monsters of the deep, gradually coming up from the clear depths below. On the surface, far as the eye could reach, nothing was visible except a solitary iceberg here and there, and a few scattered floes.

Indeed, but little ice was met with anywhere. The sloop was ten degrees above the point of greatest cold, and consequently in the same temperature as Baffin Bay and Disko. It was therefore not astonishing that the sea should be open in these summer months.

This is a fact of great practical value, for if ever the whalers can penetrate north as far as the Polar Basin, they may be sure of an immediate cargo, as this part of the ocean seems to be the general reservoir of whales and seals, and every marine species.

The day wore on, but still nothing appeared on the horizon. Hatteras never left the prow of the ship, but stood, glass in hand, eagerly gazing into the distance with anxious, questioning eyes.

CHAPTER XXII
Getting Near the Pole

HOUR after hour passed away, and still Hatteras persevered in his weary watch, though his hopes appeared doomed to disappointment.

At length, about six in the evening, a dim, hazy, shapeless sort of mist seemed to rise far away between sea and sky. It was not a cloud, for it was constantly vanishing, and then reappearing next minute.

Hatteras was the first to notice this peculiar phenomenon; but after an hour's scrutiny through his telescope, he could make nothing of it.

All at once, however, some sure indication met his eye, and stretching out his arm to the horizon, he shouted, in a clear ringing voice:

"Land! land!"

His words produced an electrical effect on his companions, and every man rushed to his side.

"I see it, I see it," said Clawbonny.

"Yes, yes, so do I!" exclaimed Johnson.

"It is a cloud," said Altamont.

"Land! land!" repeated Hatteras, in tones of absolute conviction.

Even while he spoke the appearance vanished, and when it returned again the Doctor fancied he caught a gleam of light about the smoke for an instant.

"It is a volcano!" he exclaimed.

"A volcano?" repeated Altamont.

"Undoubtedly."

"In so high a latitude?"

"Why not? Is not Iceland a volcanic island—indeed, almost made of volcanoes, one might say?"

"Well, has not our famous countryman, James Ross, affirmed the existence of two active volcanoes, the Erebus and the error, on the Southern Continent, in longitude 170° and latitude 78°? Why, then, should not volcanoes be found near the North Pole?"

"It is possible, certainly," replied Altamont.

"Ah, now I see it distinctly," exclaimed the Doctor. "It is a volcano!"

"Let us make right for it then," said Hatteras.

It was impossible longer to doubt the proximity of the coast. In twenty-four hours, probably, the bold navigators might hope to set foot on its untrodden soil. But strange as it was, now that they were so near the goal of their voyage, no one showed the joy which might have been expected. Each man sat silent, absorbed in his own thoughts, wondering what sort of place this Pole must be. The birds seemed to shun it, for though it was evening, they were all flying towards the south with outspread wings. Was it, then, so inhospitable, that not so much as a sea-gull or a ptarmigan could find a shelter? The fish, too, even the large cetacea, were hastening away through the transparent waters. What could cause this feeling either of repulsion or terror?

At last sleep overcame the tired men, and one after another dropped off, leaving Hatteras to keep watch.

He took the helm, and tried his best not to close his eyes, for he grudged losing precious time; but the slow motion of the vessel rocked him into a state of such irresistible somnolence that, in spite of himself, he was soon, like his companions, locked fast in deep slumber. He began to dream, and imagination brought back all the scenes of his past life. He dreamed of his ship, the *Forward,* and of the traitors that had burned it. Again he felt all the agonies of disappointment and failure, and forgot his actual situation: Then the scene changed, and he saw himself at the Pole unfurling the Union Jack!

While memory and fancy were thus busied, an enormous cloud of an olive tinge had begun to darken sea and sky. A hurricane was at hand. The first blast of the tempest roused the captain and his companions, and they were on their feet in an instant, ready to meet it. The sea had risen tremendously, and the ship was tossing violently up and down on the billows. Hatteras took the helm again, and kept a firm hold of it, while Johnson and Bell baled out the water which was constantly dashing over the ship.

It was a difficult matter to preserve the right course, for the thick fog made it impossible to see more than a few yards off.

This sudden tempest might well seem to such excited men, a stern prohibition against further approach to the Pole; but it needed but a glance at their resolute faces to know that they would yield neither to winds nor waves.

For a whole day the struggle lasted, death threatening them each moment; but about six in the evening, just as the fury of the waves seemed at its highest pitch, there came a sudden calm. The wind was stilled as if miraculously, and the sea became smooth as glass.

Then came a most extraordinary inexplicable phenomenon.

The fog, without dispersing, became strangely luminous, and the sloop sailed along in a zone of electric light. Mast, sail, and rigging appeared penciled in black against the phosphorescent sky with wondrous distinctness. The men were bathed in light, and their faces shone with a fiery glow.

"The volcano!" exclaimed Hatteras.

"Is it possible?" said Bell.

"No, no!" replied Clawbonny. "We should be suffocated with its flames so near."

"Perhaps it is the reflection," suggested Altamont.

"Not that much even, for then we must be near land, and in that case we should hear the noise of the eruption."

"What is it, then?" asked the captain.

"It is a cosmical phenomenon," replied the Doctor, "seldom met hitherto. If we go on, we shall soon get out of our luminous sphere and be back in the darkness and tempest again."

"Well, let's go on, come what may," said Hatteras.

The Doctor was right. Gradually the fog began to lose its light and then its transparency, and the howling wind was heard not far off. A few minutes more, and the little vessel was caught in a violent squall, and swept back into the cyclone.

But the hurricane had fortunately turned a point towards the south, and left the vessel free to run before the wind straight towards the Pole. There was imminent danger of her sinking, for she sped along at frenzied speed, and any sudden collision with rock or iceberg must have inevitably dashed her to pieces.

But not a man on board counseled prudence. They were intoxicated with the danger, and no speed could be quick enough to satisfy their longing impatience to reach the unknown.

At last they began evidently to near the coast. Strange symptoms were manifest in the air; the fog suddenly rent like a curtain torn by the wind; and for an instant, like a flash of lightning, an immense column of flame was seen on the horizon.

"The volcano! the volcano!" was the simultaneous exclamation.

But the words had hardly passed their lips before the fantastic vision had vanished. The wind suddenly changed to the southeast, and drove the boat back again from the land.

"Confound it!" said Hatteras; "we weren't three miles from the coast."

"However, resistance was impossible. All that could be done was to keep tacking; but every few minutes the little sloop would be thrown on her side though she righted herself again immediately, obedient to the helm.

As Hatteras stood with disheveled hair, grasping the helm as if welded to his hand, he seemed the animating soul of the vessel.

All at once a fearful sight met his gaze.

Scarcely twenty yards in front was a great block of ice coming right towards them mounting and falling

on the stormy billows, ready to overturn at any moment and crush them in its descent.

But this was not the only danger that threatened the bold navigators. The iceberg was packed with white bears, huddling close together, and evidently beside themselves with terror.

The iceberg made frightful lurches, sometimes inclining at such a sharp angle that the animals rolled pell-mell over each other and set up a loud growling, which mingled with the roar of the elements and made a terrible concert.

For a quarter of an hour, which seemed a whole century, the sloop sailed on in this formidable company, sometimes a few yards distant and sometimes near enough to touch. The Greenland dogs trembled for fear, but Duk was quite imperturbable. At last the iceberg lost ground, and got driven by the wind farther and farther away till it disappeared in the fog, only at intervals betraying its presence by the ominous growls of its crew.

The storm now burst forth with redoubled fury. The little bark was lifted bodily out of the water, and whirled round and round with the most frightful rapidity. Mast and sail were blown away, and went flying through the darkness, like some huge white bird. A whirlpool began to form among the waves, drawing down the ship gradually by its irresistible suction. Deeper and deeper she sank, whizzing round at such tremendous speed that, to the poor fellows on board, the water seemed motionless. All five men stood erect, gazing at each other in speechless terror. But suddenly the boat rose perpendicularly, her bow went above the edge of the vortex, and getting out of the center of attraction by her own velocity, she escaped at a tangent from the circumference, and was thrown far beyond, like a ball from a cannon's mouth.

Altamont, the Doctor, Johnson, and Bell were pitched flat on the planks. When they got up, Hatteras had disappeared.

It was two o'clock in the morning.

CHAPTER XXIII
The English Flag

FOR a few seconds they seemed stupefied, and then a cry of "Hatteras!" broke from every lip.

On all sides, nothing was visible but the tempestuous ocean. Duk barked desperately, and Bell could hardly keep him from leaping into the waves.

"Take the helm, Altamont," said the Doctor, "and let us try our utmost to find our poor captain."

Johnson and Bell seized the oars, and rowed about for more than an hour; but their search was vain—Hatteras was lost!

Lost!—and so near the Pole, just as he had caught sight of the goal!

The Doctor called, and shouted, and fired signals, and Duk made piteous lamentations; but there was no response. Clawbonny could bear up no longer; he buried his head in his hands, and fairly wept aloud.

At such a distance from the coast it was impossible for Hatteras to reach it alive, without an oar or even so much as a spar to help him; if ever he touched the haven of his desire, it would be as a swollen, mutilated corpse.

Longer search was useless, and nothing remained but to resume the route north. The tempest was dying out, and about five in the morning on the 11th of July, the wind fell, and the sea gradually became calm. The sky recovered its polar clearness, and less than three miles away the land appeared in all its grandeur.

The next continent was only an island, or rather a volcano, fixed like a lighthouse on the North Pole of the world.

The mountain was in full activity, pouring out a mass of white hot stones and glowing rock. At every fresh eruption there was a convulsive heaving within, as if some mighty giant were respiring, and the masses ejected were thrown up high into the air amidst jets of bright flames, streams of lava rolling down the sides in impetuous torrents. In one part, serpents of fire seemed writhing and wriggling amongst smoking rocks, and in another the glowing liquid fell in cascades, in the midst of purple vapor, into a river of fire below, formed of a thousand igneous streams, which emptied itself into the sea, the waters hissing and seething like a boiling cauldron.

Apparently there was only one crater to the volcano, out of which the columns of fire issued, streaked with forked lightning. Electricity seemed to have something to do with this magnificent panorama.

Above the panting flames waved an immense plume-shaped cloud of smoke, red at its base and black at its summit. It rose with incomparable majesty, and unrolled in thick volumes.

The sky was ash-color to a great height, and it was evident that the darkness that had prevailed while the tempest lasted, which had seemed quite inexplicable to the Doctor, was owing to the columns of cinders overspreading the sun like a thick curtain. He remembered a similar phenomenon which occurred in the Barbadoes, where the whole island was plunged in profound obscurity by the mass of cinders ejected from the crater of Isle St. Vincent.

This enormous volcanic rock in the middle of the sea was six thousand feet high, just about the altitude of Hecla.

It seemed to rise gradually out of the water as the boat got nearer. There was no trace of vegetation, indeed there was no shore; the rock ran straight down to the sea.

"Can we land?" said the Doctor.

"The wind is carrying us right to it," said Altamont.

"But I don't see an inch of land to set our foot upon."

"It seems so at this distance," said Johnson; "but we shall be sure to find some place to run in our boat at, and that is all we want."

"Let us go, then," said Clawbonny, dejectedly.

He had no heart now for anything. The North Pole was indeed before his eyes, but not the man who had discovered it.

As they got nearer the island, which was not more than eight or ten miles in circumference, the naviga-

tors noticed a tiny fiord, just large enough to harbor their boat, and made towards it immediately. They feared their captain's dead body would meet their eyes on the coast, and yet it seemed difficult for a corpse to lie on it, for there was no shore, and the sea broke on steep rocks, which were covered with cinders above watermark.

At last the little boat glided gently into the narrow opening between two sandbanks just visible above the water, where she would be safe from the violence of the breakers; but before she could be moored, Duk began howling and barking again in the most piteous manner, as if calling on the cruel sea and stony rocks to yield up his lost master. The Doctor tried to calm him by caresses, but in vain. The faithful beast, as if he would represent the captain, sprang on shore with a tremendous bound, sending a cloud of cinders afer him.

"Duk! Duk!" called Clawbonny.

But Duk had already disappeared.

After the sloop was made fast, they all got out and went after him. Altamont was just going to climb to the top of a pile of stones, when the Doctor exclaimed, "Listen! Listen!"

Duk was barking vehemently some distance off, but his bark seemed full of grief rather than fury.

"Has he come on the track of some animal, do you think?" asked Johnson.

"No, no!" said Clawbonny, shuddering. "His bark is too sorrowful; it is the dog's tear. He has found the body of Hatteras."

They all four rushed forward, in spite of the blinding cinder-dust, and came to the far end of a fiord, where they discovered the dog barking round a corpse wrapped in the British flag!

"Hatteras! Hatteras!" cried the Doctor, throwing himself on the body of his friend. But next minute he started up with an indescribable cry, and shouted, "Alive! alive!"

"Yes!" said a feeble voice, "yes, alive at the North Pole, on *Queen's Island.*"

"Hurrah for England!" shouted all with one accord.

"And for America!" added Clawbonny, holding out one hand to Hatteras and the other to Altamont.

Duk was not behind with his hurrah, which was worth quite as much as the others.

For a few minutes the joy at the recovery of their captain filled all their hearts, and the poor fellows could not restrain their tears.

The Doctor found on examination, that he was not seriously hurt. The wind threw him on the coast where landing was perilous work, but, after being driven back more than once into the sea, the hardy sailor had managed to scramble out on a rock, and gradually to hoist himself above the waves.

Then he must have become insensible, for he remembered nothing more except rolling himself in his flag. He only awoke to consciousness with the loud barking and caresses of his faithful Duk.

After a little Hatteras was able to stand up, supported by the Doctor, and tried to get back to the boat.

He kept exclaiming, "The Pole! the North Pole!"

"You are happy now?" said his friend.

"Yes, happy! And are not you? Isn't it a joy to find yourself here! The ground we tread is round the Pole! The air we breathe is the air that blows round the Pole! The sea we have crossed is the sea which washes the Pole! Oh! the North Pole! the North Pole!"

He had became quite delirious with excitement, and fever burned in his veins. His eyes shone with unnatural brilliancy, and his brain seemed on fire. Perfect rest was what he most needed, for the Doctor found it impossible to quiet him.

A place of encampment must therefore be fixed upon immediately.

ALTAMONT speedily discovered a grotto composed of rocks which had so fallen as to form a sort of cave. Johnson and Bell carried in provisions and gave the dogs their liberty.

About eleven o'clock, breakfast, or rather dinner, was ready, consisting of pemmican, salt meat, and smoking-hot tea and coffee.

But Hatteras would do nothing till the exact position of the island was ascertained; so the Doctor and Altamont set to work with their instruments, and found that the exact latitude of the grotto was 89° 59′ 15″. The longitude was of little importance, for all the meridians blended a few hundred feet higher.

The 90° of latitude was then only about three-quarters of a mile off, or just about the summit of the volcano.

When the result was communicated to Hatteras, he desired that a formal document might be drawn up to attest the fact, and two copies made, one of which should be deposited on a cairn on the island.

Clawbonny was the scribe, and indited the following document, a copy of which is now among the archives of the Royal Geographical Society of London:—

"On this 11th day of July, 1861, in North latitude 89° 59′ 15″ was discovered *Queen's Island* at the North Pole, by Captain Hatteras, Commander of the brig *Forward* of Liverpool, who signs this, as do also all his companions.

"Whoever may find this document is requested to forward it to the Admiralty.

"(Signed) JOHN HATTERAS, Commander of the *Forward.*
"DR. CLAWBONNY.
"ALTAMONT, Commander of the *Porpoise.*
"JOHNSON, Boatswain.
"BELL, Carpenter."

"And now, friends, come to table," said the Doctor, merrily.

Coming to table was just squatting on the ground.

"But who," said Clawbonny, "would not give all the tables and dining-rooms in the world to dine at 89° 59′ and 15″ N. latitude?"

It was an exciting occasion, this first meal at the

Pole! What neither ancients nor moderns, neither Europeans, nor Americans, nor Asiatics had been able to accomplish was now achieved, and all past sufferings and perils and losses were forgotten in the glow of success.

"But, after all," said Johnson, after toasts to Hatteras and the North Pole had been enthusiastically drunk, "what is there so very special about the North Pole? Will you tell me, Dr. Clawbonny, why we risk so much to reach the pole?"

"Just this, my good Johnson. It is the only point of the globe that is motionless; all the other points are revolving with extreme rapidity."

"But I don't see that we are any more motionless here than at Liverpool."

"Because in both cases you are a party concerned, both in the motion and the rest; but the fact is certain, nevertheless."

Clawbonny then went on to describe the diurnal and annual motions of the earth—the one round its own axis, the extremities of which are the poles, which is accomplished in twenty-four hours, and the other round the sun, which takes a whole year.

Bell and Johnson listened half incredulously, and couldn't see why the earth could not have been allowed to keep still, till Altamont informed them that they would then have had neither day nor night, nor spring, nor summer, nor autumn, nor winter.

"Ay, and worse still," said Clawbonny, "if the motion chanced to be interrupted, we should fall right into the sun in sixty-four and a half days."

"What! take sixty-four and a half days to fall?" exclaimed Johnson.

"Yes, we are ninety-five millions of miles off. But when I say the Pole is motionless, it is not strictly true; it is only so in comparison with the rest of the globe, for it has a certain movement of its own, and completes a circle in about twenty-six thousand years. This comes from the precession of the equinoxes."

A long and learned talk was started on this subject between Altamont and the Doctor, simplified, however, as much as possible, for the benefit of Bell and Johnson.

Hatteras took no part in it, and even when they went on to speculate about the earth's center, and discussed several of the theories that had been advanced respecting it, he seemed not to hear; it was evident his thoughts were far away.

Among other opinions put forth was one in our own days, which greatly excited Altamont's surprise. It was held that there was an immense opening at the poles which led into the heart of the earth, and that it was out of the opening that the light of the *Aurora Borealis* streamed. This was gravely stated, and Captain Symmes, a countryman of our own, actually proposed that Sir Humphrey Davy, Humboldt, and Arago should undertake an expedition through it, but they refused absolutely.

"And quite right too," said Altamont.

"So say I; but you see, my friends, what absurdities imagination has conjured up about those regions, and how, sooner or later, the simple reality comes to light."

CHAPTER XXIV
Mount Hatteras

AFTER this conversation they all made themselves as comfortable as they could, and lay down to sleep.

All, except Hatteras; and why could this extraordinary man not sleep like the others? Was not the purpose of his life attained now? Had he not realized his most daring project? Why could he not rest? Indeed, might not one have supposed that, after the strain his nervous system had undergone, he would long for rest?

But no, he grew more and more excited, and it was not the thought of returning that so affected him. Was he bent on going further still? Had his passion for travel no limits? Was the world too small for him now he had circumnavigated it?

What ever might be the cause, he could not sleep; yet this first night at the Pole was clear and calm. The isle was absolutely uninhabited.

Next morning, when Altamont and the others awoke, Hatteras was gone. Feeling uneasy at his absence, they hurried out of the grotto in search of him. There he was standing on a rock, gazing fixedly at the top of the mountain. His instruments were in his hand, and he was evidently determining the exact longitude and latitude.

The Doctor went towards him and spoke, but it was long before he could rouse him from his absorbing contemplations. At last the captain seemed to understand and Clawbonny said:

"Let us go round the island. Here we are, all ready for our last excursion."

"The last!" repeated Hatteras, as if in a dream. "Yes! the last truly; but," he added, with more animation, "the most wonderful."

He pressed both hands on his brow as he spoke, as if to calm the inward tumult.

Just then Altamont and the others came up, and their appearance seemed to dispel the hallucinations under which he was laboring.

"My friends," he said, in a voice full of emotion, "thanks for your courage, thanks for your perseverance, thanks for your superhuman efforts, through which we are permitted to set our feet on this soil."

"Captain," said Johnson, "we have only obeyed orders; to you alone belongs the honor."

"No, no!" exclaimed Hatteras, with a violent outburst of emotion, "to all of you as much as to me! To Altamont as much as any of us, as much as the Doctor himself! Oh, let my heart break in your hands; it cannot contain its joy and gratitude any longer."

He grasped the hands of his brave companions as he spoke, and paced up and down as if he had lost all self-control.

"And as friends," added Clawbonny.

"Yes; but all did not do it," replied Hatteras; "some gave way. However, we must pardon them—pardon both the traitors and those who were led away by them. Poor fellows! I forgive them. You hear me, Doctor?"

"Yes," replied Clawbonny, beginning to be seriously

uneasy at his friend's excitement at sight of the crater.

"I have no wish, therefore," continued the captain, "that they should lose the little fortune they came so far to seek. No, the original agreement is to remain unaltered, and they shall be rich—if ever they see England again."

It would have been difficult not to have been touched by the pathetic tone of voice in which Hatteras said this.

"But, captain," interrupted Johnson, trying to joke, "one would think you were making your will!"

"Perhaps I am," said Hatteras gravely.

"And yet you have a long bright career of glory before you!"

"Who knows?" was the reply.

No one answered, and the Doctor did not dare to guess his meaning; but Hatteras soon made them understand it, for presently he said, in a hurried, agitated manner, as if he could scarcely command himself.

"Friends, listen to me. We have done much already, but much yet remains to be done."

His companions heard him with profound astonishment.

"Yes," he resumed, "we are close to the Pole, but we are not on it."

"How do you make that out?" said Altamont.

"Yes," replied Hatteras, with vehemence, "I said an Englishman should plant his foot on the Pole of the world! I said it, and an Englishman shall."

"What!" cried Clawbonny.

"We are still 45″ from the unknown point," resumed Hatteras, with increasing animation, "and to that point I shall go."

"But it is on the summit of the volcano," said the Doctor.

"I shall go."

"It is an inaccessible cone!"

"I shall go."

"But it is a yawning fiery crater!"

"I shall go."

His friends were stupefied, and gazed in terror at the blazing mountain.

At last the Doctor recovered himself, and began to urge and entreat Hatteras to renounce his project. He tried every means his heart dictated, from humble supplications to friendly threats; but he could gain nothing—a sort of frenzy had come over the captain, an absolute monomania about the Pole.

Nothing but violent measures would keep him back from destruction, but the Doctor was unwilling to employ these yet.

He trusted, moreover, that physical impossibilities, insuperable obstacles, would bar his further progress, and meantime, finding all protestations were useless, he simply said:

"Very well, since you are bent on it, we'll go too."

"Yes," replied Hatteras, "half-way up the mountain, but not a step beyond. You know you have to carry back to England the duplicate of the document in the cairn—"

"Yes, but—"

"It is settled," said Hatteras, in an imperious tone; "and since the prayers of a friend will not suffice, the captain commands."

The Doctor did not insist longer, and a few minutes later the little band set out, accompanied by Duk.

It was about eight o'clock when they commenced their difficult ascent; the sky was splendid, and the thermometer stood at 52°.

Hatteras and his dog went first, closely followed by the others.

"I am afraid," said Johnson to the Doctor.

"No, no, there's nothing to be afraid of; we are here."

THIS singular little island appeared to be of recent formation, and was evidently the product of successive volcanic eruptions. The rocks were all lying loose on the top of each other, and it was a marvel how they preserved their equilibrium. Strictly speaking, the mountain was only a heap of stones thrown down from a height, and the mass of rocks which composed the island had evidently come out of the bowels of the earth.

The earth, indeed, may be compared to a vast cauldron of spherical form, in which, under the influence of a central fire, immense quantities of vapors are generated, which would explode the globe but for the safety-valves outside.

These safety-valves are volcanoes; when one closes, another opens; and at the Poles, where the crust of the earth is thinner, owing to its being flattened, it is not surpising that a volcano should be suddenly formed by the upheaving of some part of the ocean-bed.

The Doctor, while following Hatteras, was closely following all the peculiarities of the island, and he was further confirmed in his opinion as to its recent formation by the absence of water. Had it existed for centuries, the thermal springs would have flowed from its bosom.

As they got higher, the ascent became more and more difficult, for the flanks of the mountain were almost perpendicular, and it required the utmost care to keep them from falling. Clouds of scoriæ and ashes would whirl round them repeatedly, threatening them with asphyxia, or torrents of lava would bar their passage. In parts where these torrents ran horizontally, the outside had become hardened; while underneath was the boiling lava, and every step the travelers took had first to be tested with the iron-tipped staff to avoid being suddenly plunged into the scalding liquid.

At intervals, large fragments of red-hot rock were thrown up from the crater, and burst in the air like bomb-shells, scattering the *débris* to enormous distances in all directions.

Hatteras, however, climbed up the steepest ascents with surprising agility, disdaining the help of his staff.

He arrived before long at a circular rock, a sort of plateau about ten feet wide. A river of boiling lava surrounded it, except in one part, where it forked away to a higher rock, leaving a narrow passage, through which Hatteras fearlessly passed.

Here he stopped, and his companions managed to rejoin him. He seemed to be measuring with his eye the

distance he had yet to get over. Horizontally, he was not more than two hundred yards from the top of the crater, but vertically he had nearly three times that distance to traverse.

The ascent had occupied three hours already. Hatteras showed no signs of fatigue, while the others were almost spent.

The summit of the volcano appeared inaccessible, and the Doctor determined at any price to prevent Hatteras from attempting to proceed. He tried gentle means first, but the captain's excitement was fast becoming delirium. During their ascent, symptoms of insanity had become more and more marked, and no one could be surprised who knew anything of his previous history.

"Hatteras," said the Doctor, "it is enough; we cannot go farther!"

"Stop, then," he replied, in a strangely altered voice; "I am going higher."

"No, it is useless; you are at the Pole already."

"No, no! higher, higher!"

"My friend, do you know who is speaking to you? It is I, Dr. Clawbonny."

"Higher, higher!" repeated the madman.

"Very well, we shall not allow it—that is all."

He had hardly uttered the words before Hatteras, by a superhuman effort, sprang over the boiling lava, and was beyond the reach of his companions.

A cry of horror burst from every lip, for they thought the poor captain must have perished in that fiery gulf; but there he was safe on the other side, accompanied by his faithful Duk, who would not leave him.

He speedily disappeared behind a curtain of smoke, and they heard his voice growing fainter in the distance, shouting:

"To the north! to the north! to the top of Mount Hatteras! Remember Mount Hatteras!"

All pursuit of him was out of the question; it was impossible to leap across the fiery torrent, and equally impossible to get round it. Altamont, indeed, was mad enough to make an attempt, and would certainly have lost his life if the others had not held him back by main force.

"Hatteras! Hatteras!" shouted the Doctor, but no response was heard save the faint bark of Duk.

At intervals, however, a glimpse of him could be caught through the clouds of smoke and showers of ashes. Sometimes his head, sometimes his arm appeared; then he was out of sight again, and a few minutes later was seen higher up clinging to the rocks. His size constantly decreased with the fantastic rapidity of objects rising upwards in the air. In half an hour he was only half his size.

The air was full of the deep rumbling noise of the volcano, and the mountain shook and trembled. From time to time a loud fall was heard behind, and the travelers would see some enormous rock rebounding from the heights to engulf itself in the polar basin below.

Hatteras did not even turn once to look back, but marched straight on, carrying his country's flag attached to his staff. His terrified friends watched every movement, and saw him gradually decrease to microscopic dimensions, while Duk looked no larger than a rat.

Then came a moment of intense anxiety, for the wind beat down on them an immense sheet of flame, and they could see nothing but the red glare. A cry of agony escaped the Doctor; but an instant afterwards Hatteras reappeared, waving his flag.

For a whole hour this fearful spectacle went on—an hour of battle with unsteady loose rocks and quagmires of ashes, where the foolhardy climber sank up to his knees. Sometimes they saw him hoist himself up by leaning knees and loins against the rocks in narrow, intricate winding paths, and sometimes he would be hanging on by both hands to some sharp crag, swinging to and fro like a withered tuft.

At last he reached the summit of the mountain, the mouth of the crater. Here the Doctor hoped the infatuated man would stop, perhaps, recover his senses, and expose himself to no more danger than the descent involved.

Once more he shouted: "Hatteras! Hatteras!"

There was such a pathos of entreaty in his tone that Altamont felt moved to his inmost soul.

"I'll save him yet!" he exclaimed; and before Clawbonny could hinder him, he had cleared with a bound the torrent of fire, and was out of sight among the rocks.

Meantime, Hatteras had mounted a rock which overhung the crater, and stood waving his flag amidst showers of stones which rained down on him. Duk was by his side; but the poor beast was growing dizzy in such close proximity to the abyss.

Hatteras balanced his staff with one hand, and with the other sought to find the precise mathematical point where all the meridians of the globe meet, the point on which it was his sublime purpose to plant his foot.

All at once the rock gave way, and he disappeared. A cry of horror broke from his companions, and rang to the top of the mountain. Clawbonny thought his friend had perished, and lay buried for ever in the depths of the volcano. A second—only a second, though it seemed an age—elapsed, and there was Altamont and the dog holding the ill-fated Hatteras! Man and dog had caught him at the very moment when he disappeared in the abyss.

Hatteras was saved! Saved in spite of himself; and half-an-hour later he lay unconscious in the arms of his despairing companions.

When he came to himself, the Doctor looked at him in speechless anguish, for there was no glance of recognition in his eye. It was the eye of a blind man, who gazes without seeing.

"Good heavens!" exclaimed Johnson, "he is blind! He cannot see us."

"No!" replied Clawbonny, "no! My poor friends, we have only saved the body of Hatteras; his soul is left behind on the top of the volcano. He is not blind. His reason is gone!"

"Insane!" exclaimed Johnson and Altamont, in consternation.

"Insane!" replied the Doctor, and the big tears ran down his cheeks.

CHAPTER XXV
Return South

THREE hours after this sad *dénouement* of the adventures of Captain Hatteras, the whole party were back once more in the grotto.

Clawbonny was asked his opinion as to what was best to be done.

"Well, friends," he said, "we cannot stay longer in this island; the sea is open, and we have enough provisions. We ought to start at once, and get back without the least delay to Fort Providence, where we must winter."

"That is my opinion, too," said Altamont. "The wind is favorable, so to-morrow we will get to sea."

The day passed in profound dejection. The insanity of the captain was a bad omen, and when they began to talk over the return voyage, their hearts failed them for fear. They missed the intrepid spirit of their leader.

However, like brave men, they prepared to battle anew with the elements and with themselves, if ever they felt inclined to give way.

Next morning they made all ready to sail, and brought the tent and all its belongings on board.

But before leaving these rocks, never to return, the Doctor carrying out the intentions of Hatteras, had a cairn erected on the very spot where the poor fellow had jumped ashore. It was made of great blocks placed one on the top of the other, so as to be a landmark perfectly visible while the eruption of the volcano left it undisturbed. On one of the side stones, Bell chiseled the simple inscription:

JOHN HATTERAS

The duplicate of the document attesting the discovery of the North Pole was enclosed in a tinned iron cylinder, and deposited in the cairn, to remain a silent witness among those desert rocks.

This done, the four men and the captain, a poor body without a soul, set out on the return voyage, accompanied by the faithful Duk, who had become sad and downcast. A new sail was manufactured out of the tent, and about ten o'clock, the little boat sailed out before the wind.

She made a quick passage, finding abundance of open water. It was certainly easier to get away from the Pole than to get to it.

But Hatteras knew nothing that was passing around him. He lay full length in the boat, perfectly silent, with lifeless eye and folded arms, and Duk lying at his feet. Clawbonny frequently addressed him, but could elicit no reply.

On the 15th they sighted Altamont Harbor, but as the sea was open all along the coast, they determined to go round to Victoria Bay by water, instead of crossing New America in the sled.

The voyage was easy and rapid. In a week they accomplished what had taken a fortnight in the sled, and on the 23rd they cast anchor in Victoria Bay.

As soon as the boat was made fast, they all hastened to Fort Providence. But what a scene of devastation met their eyes! Doctor's House, stores, powder-magazine, fortifications, all had melted away, and the provisions had been ransacked by devouring animals.

The navigators had almost come to the end of their supplies, and had been reckoning on replenishing their stores at Fort Providence. The impossibility of wintering there now was evident, and they decided to get to Baffin Bay by the shortest route.

"We have no alternative," said Clawbonny. "Baffin Bay is not more than six hundred miles distant. We can sail as long as there is water enough under our boat, and get to Jones Sound, and then on to the Danish settlements."

"Yes," said Altamont; "let us collect what food remains, and be off at once."

After a thorough search, a few cases of pemmican were found scattered here and there, and two barrels of preserved meat, altogether enough for six weeks, and a good supply of powder. It was soon collected and brought on board, and the remainder of the day was employed in caulking the boat and putting her in good trim.

Next morning they put out once more to sea. The voyage presented no great difficulties, the drift-ice being easily avoided; but still the Doctor thought it advisable, in case of possible delays, to limit the rations to one-half. This was no great hardship, as there was not much work for anyone to do, and all were in perfect health.

Besides, they found a little shooting, and brought down ducks, and geese, and guillemots or auks. Water they were able to supply themselves with in abundance, from the fresh-water icebergs they constantly fell in with as they kept near the coast, not daring to venture out in the open sea in so frail a bark.

At that time of the year, the thermometer was already constantly below freezing point. The frequent rains changed to snow, and the weather became gloomy. Each day the sun dipped lower below the horizon, and on the 30th, for a few minutes, it was out of sight altogether.

However, the little boat sailed steadily on. They knew what fatigues and obstacles a land journey involved, if they should be forced to adopt it, and no time was to be lost, for soon the open water would harden to firm ground; already the young ice had begun to form. In these high latitudes there is neither spring nor autumn; winter follows close on the heels of summer.

ON the 31st the first stars glimmered overhead, and from that time forward there was continual fog, which considerably impeded navigation.

The Doctor became very uneasy at these multiplied indications of approaching winter. He knew the difficulties Sir John Ross had to contend with after he left his ship to try and reach Baffin Bay, and how, after all, he was compelled to return and pass a fourth winter on board. It was bad enough with shelter and food and fuel, but if any such calamity befell the survivors of the *Forward,* if they were obliged to stop or return, they were lost.

The Doctor said nothing of his anxieties to his companions, but only urged them to get as far east as possible.

At last, after thirty days' tolerably quick sailing, and after battling for forty-eight hours against the increasing drift ice, and risking the frail boat a hundred times, the navigators saw themselves blocked in on all sides. Further progress was impossible, for the sea was frozen in every direction, and the thermometer was only 15° above zero.

Altamont made a reckoning with scrupulous precision, and found they were in 77° 15′ latitude, and 85° 2′ longitude.

"This is our exact position, then," said the Doctor. "We are in South Lincoln, just at Cape Eden, and are entering Jones Sound. With a little more good luck, we should have found open water right to Baffin Bay. But we must not grumble. If my poor Hatteras had found as navigable a sea at first, he would have soon reached the Pole. His men would not have deserted him, and his brain would not have given way under the pressure of terrible trial."

"I suppose, then," said Altamont, "our only course is to leave the boat, and get by sled to the east coast of Lincoln."

"Yes; but I think we should go through Jones Sound, and get to South Devon instead of crossing Lincoln."

"Why?"

"Because the nearer we get to Lancaster Sound, the more chance we have of meeting whalers."

"You are right; but I question whether the ice is firm enough to make it practicable."

"We'll try," replied Clawbonny.

The little vessel was unloaded, and the sled put together again. All the parts were in good condition, so the next day the dogs were harnessed, and they started off along the coast to reach the ice-field; but Altamont's opinion proved right. They could not get through Jones Sound, and were obliged to follow the coast to Lincoln.

At last, on the 24th, they set foot on North Devon.

"Now," said Clawbonny, "we have only to cross this, and get to Cape Warender at the entrance to Lancaster Sound."

But the weather became frightful, and very cold. The snow-storms and tempests returned with winter violence, and the travelers felt too weak to contend with them. Their stock of provisions was almost exhausted, and rations had to be reduced now to a third, that the dogs might have food enough to keep them in working condition.

The nature of the ground added greatly to the fatigue. North Devon is extremely wild and rugged, and the path across the Trauter mountains is through difficult gorges. The whole party—men and dogs, and sled alike—were frequently forced to stop, for they could not struggle on against the fury of the elements. More than once despair crept over the brave little band, hardy as they were, and used to polar sufferings. Though scarcely aware of it themselves, they were completely worn out, physically and mentally.

It was not till the 30th of August that they emerged from those wild mountains into a plain which seemed to have been upturned and convulsed by volcanic action at some distant period.

Here it was absolutely necessary to take a few days' rest, for the travelers could not drag one foot after the other, and two of the dogs had died from exhaustion. None of the party felt equal to put up the tent, so they took shelter behind an iceberg.

Provisions were now so reduced that, notwithstanding their scanty rations, there was only enough left for one week. Starvation stared the poor fellows in the face.

Altamont, who had displayed great unselfishness and devotion to the others, roused his sinking energies, and determined to go out and find food for his comrades.

He took his gun, called Duk, and went off almost unnoticed by the rest.

He had been absent about an hour, and only once during that time had they heard the report of his gun and now he was coming back empty-handed, but running as if terrified.

"What is the matter?" asked the Doctor.

"Down there, under the snow!" said Altamont, speaking as if scared, and pointing in a particular direction.

"What?"

"A whole party of men!"

"Alive?"

"Dead—frozen—and even—"

He did not finish the sentence, but a look of unspeakable horror came over his face. The Doctor and the others were so roused by this incident, that they managed to get up and drag themselves after Altamont towards the place he indicated. They soon arrived at a narrow part at the bottom of a ravine, and what a spectacle met their gaze! Dead bodies, already stiff, lay half-buried in a winding-sheet of snow. A leg visible here, an arm there, and yonder shrunken hands and rigid faces, stamped with the expression of rage and despair.

The Doctor stooped down to look at them more closely, but instantly started back pale and agitated, while Duk barked ominously. "Horrible horrible!" he said.

"What is it?" asked Johnson.

"Don't you recognize them?"

"What do you mean?"

"Look and see!"

It was evident this ravine had been but recently the scene of a fearful struggle with cold, and despair, and starvation, for by certain horrible remains it was manifest that the poor wretches had been feeding on human flesh, perhaps while still warm and palpitating; and among them the Doctor recognized Shandon, Pen, and the ill-fated crew of the *Forward!* Their strength had failed; provisions had come to an end; their boat had been broken, perhaps by an avalanche or engulfed in some abyss, and they could not take advantage of the open sea; or perhaps they had lost their way in wandering over these unknown continents. Moreover, men who set out under the excitement of a revolt were not likely to remain long united. The leader of a rebellion has but a doubtful power, and no doubt Shandon's authority had been soon cast off.

Be that as it may, it was evident the crew had come through agonies of suffering and despair before this last terrible catastrophe, but the secret of their miseries is buried with them beneath the polar snows.

"Come away! come away!" said the Doctor, dragging his companions from the scene. Horror gave them momentary strength, and they resumed their march without stopping a minute longer.

CHAPTER XXVI

Conclusion

IT would be useless to enumerate all the misfortunes which befell the survivors of this expedition. Even the men themselves were never able to give any detailed narrative of the events which occurred during the week subsequent to the horrible discovery related in the last chapter. However, on the 9th of September, by superhuman exertions, they arrived at last at Cape Horsburg, the extreme point of North Devon.

They were absolutely starving. For forty-eight hours they had tasted nothing, and their last meal had been off the flesh of their last Esquimau dog. Bell could go no further, and Johnson felt himself dying.

They were on the shore of Baffin Bay, now half-frozen over; that is to say, on the road to Europe, and three miles off the waves were dashing noiselessly on the sharp edges of the ice-field. Here they must wait their chance of a whaler appearing, and for how long?

But Heaven pitied the poor fellows, for the very next day Altamont distinctly perceived a sail on the horizon.

Everyone knows the torturing suspense that follows such an appearance, and the agonizing dread lest it should prove a false hope. The vessel seems alternately to approach and recede, and too often, just at the very moment when the poor castaways think they are saved, the sail begins to disappear, and is soon out of sight.

The Doctor and his companions went through all these experiences. They had succeeded in reaching the western boundary of the ice-field by carrying and pushing each other along, and they watched the ship gradually fade away from view without observing them.

Just then a happy inspiration came to the Doctor. His fertile genius supplied him with one last idea.

A floe, driven by the current, struck against the ice-field, and Clawbonny exclaimed, pointing to it:

"Let us embark on this floe!"

"Oh! Dr. Clawbonny, Dr. Clawbonny," said Johnson, pressing his hand.

Bell, assisted by Altamont, hurried to the sled, and brought back one of the poles, which he stuck fast on the ice like a mast, and fastened it with ropes. The tent was torn up to furnish a sail, and as soon as the frail raft was ready the poor fellows jumped upon it, and sailed out to the open sea.

Two hours later, after unheard-of exertions, the survivors of the *Forward* were picked up by the *Hans Christian*, a Danish whaler, on her way to Davis Strait. They were more like specters than human beings, and the sight of their sufferings was enough.

Ten days afterwards, Clawbonny, Johnson, Bell, Altamont, and Captain Hatteras landed at a town in Zealand, an island belonging to Denmark. They took the steamer to Kiel, and from Kiel proceeded by Altona and Hamburg to London, where they arrived on the 13th of the same month.

The first care of Clawbonny was to request the Royal Geographical Society to receive a communication from him. He was accordingly admitted to the next *séance*, and one can imagine the astonishment of the learned assembly and the enthusiastic applause produced by the reading of Hatteras's document.

The English have a passion for geographical discovery, from the lord to the cockney, from the merchant down to the dock laborer, and the news of this grand discovery speedily flashed along the telegraph wires, throughout the length and breadth of the kingdom. Hatteras was lauded as a martyr by all the newspapers, and every Englishman felt proud of him.

The Doctor and his companions had the honor of being presented to the Queen by the Lord Chancellor, and they were fêted and "lionized" in all quarters.

The Government confirmed the names of "Queen's Island," "Mount Hatteras," and "Altamont Harbor."

Altamont would not part from his companions in misery and glory, but followed them to Liverpool, where they were joyously welcomed back, after being so long supposed dead and buried beneath the snows.

But Dr. Clawbonny would never allow that any honor was due to himself. He claimed all the merit of the discovery for his unfortunate captain, and in the narrative of his voyage, published the next year under the auspices of the Royal Geographical Society, he places John Hatteras on a level with the most illustrious navigators, and makes him the compeer of all the brave, daring men who have sacrificed themselves for the progress of science.

The insanity of this poor victim of a sublime passion was of a mild type, and he lived quietly at Sten Cottage, a private asylum near Liverpool, where the Doctor himself had placed him. He never spoke, and understood nothing that was said to him: reason and speech had fled together. The only tie that connected him with the outside world was his friendship for Duk, who was allowed to remain with him.

For a considerable time the captain had been in the habit of walking in the garden for hours, accompanied by his faithful dog, who watched him with sad, wistful eyes, but his promenade was always in one direction in a particular part of the garden. When he got to the end of this path, he would stop and begin to walk backwards. If anyone stopped him he would point with his finger towards a certain part of the sky, but let anyone attempt to turn him round, and he became angry, while Duk, as if sharing his master's sentiments, would bark furiously.

The Doctor, who often visited his afflicted friend, noticed this strange proceeding one day, and soon understood the reason of it.

This was the secret: John Hatteras invariably faced towards the North.

THE END.

DANGER

By Irvin Lester and Fletcher Pratt

Authors of: "The Great Steel Panic," "The Roger Bacon Formula," etc.

THE wind rose in the night and by dawn the sky was streaming with torn and ragged masses of cloud moving from south to north like an army in flight. There was a shiver of cold in the air and the seas ran so high that effective work was impossible, so we gathered in Professor Hartford's cabin to help the old man brave out his discomfort by getting him to talk. The way in which he kept up his spirit, if not his body, through all the miseries of seasickness on that trip, was one of the finest exhibitions of courage I have seen anywhere.

As the senior member of the Museum's staff he was, in a sense, in charge of the expedition, though like the rest of us, he was inclined to let things run themselves while he pursued his specialty. Perhaps it was fortunate for him that the protozoa can be studied as well on a constantly moving steamer as on dry land; for the work kept his mind off his troubles. At all events, every day that was calm enough for him to be out of bed, found him poring over his microscope in search of hitherto undescribed forms in this remote corner of the Pacific.

On days such as this he lay in his bunk, and between uneasy heavings of the *mal-de-mer* that plagued him, lectured our crowd of assorted scientific experts on the importance of unicellular life. Very interesting lectures they must have been to the other chaps; even I was sometimes caught by the spell of the professor's keen and philosophical observation, and as a mere artist I always felt more or less a misfit among all those -ologies and -isms.

I remember this day in particular, partly because the evening brought us to our first view of Easter Island and partly because the conversation turned to those scientific generalizations, which are both easier to understand and more interesting to the non-scientific hearer. But even then, I probably would have recalled it only as one of a number of similar talks, had not after events given it a peculiar, almost a sinister significance.

Burgess, our entomologist, had been trying to draw the professor out by descanting on the rising tide of insect life. "Sooner or later," he declared, "we will have to fight for our lives with them. Science always plods along behind their attacks. They have taken the chestnut, the boll-weevil and corn-borer are taking two more of our economically important plants. Who knows but that nature is working in its slow way to send us after the dinosaurs?"

Slap, slap, went the waves against the cabin wall.

"Perhaps, perhaps," mused Professor Hertford, "though I incline to think that the insects will never drive man from the planet. Evolution allows a group only one opportunity—the insects had their chance to rule the world in the Carboniferous, and failed.

". . . No," he went on, "there are many lines of evolution untried, but none of them lead through existing forms. When a more capable type than man appears, it will be in a wholly new form of animal life—perhaps even a direct evolution from the protozoa. So far as we know, evolution along that line has never taken place to any great extent. The division between the one-celled and many-celled animals is sharper than that between an insect and an elephant. Think of a one-celled animal, practically immortal as they are and possessed of intelligence. No matter what work we do, no matter what records we leave, the greater portion of human knowledge perishes with the minds that give it birth. Think what it would mean if one person could go on gathering knowledge through the centuries."

"But," objected Burgess, "a parmoecium hasn't any brain tissue. You can't have that without some nervous organization."

"But, my dear Burgess," said the professor, urbanely, "is brain tissue necessary to thought? You might as well say fins are necessary to swimming. Neither the polar bear nor the octopus have them, yet both can swim very well. Nature has a queer way of accomplishing similar results by all sorts of different means. Suppose thought is what Osborn hints it is—a matter of chemical reaction, and interaction—is there any need for brain tissue in which the thought must take place?"

"All true enough," said Burgess, "but you must admit that without proprioceptors there can be no sensation, and with a cortex—"

THE conversation became so technical that I was perforce eliminated from it, and wandered down the iron stairway to watch the engines. For a time I sat there, vainly trying to put on paper the flicker of those bright moving parts—so beautifully ordered, so Roman in their efficient performance of their task,

EASTER ISLAND has for many years been a subject for considerable conjecture. Though many expeditions have traveled there and made intensive investigations, no definite reasons could be found for the complete lack of human existence. There are many signs of life having been there at some time. The statues there remain a mystery. So does any reason as to why the area of water and islands called the Agassiz Triangle is so devoid of life.

The co-authors of this story, apparently, have also wondered about these questions and have developed an original explanation of unusual interest.

With an indescribably swaying motion, the jelly-like mass in the cage seemed to surge through the narrow opening in the cage, and as it surged, the air about it was filled with the flash of those deadly darts. I heard Howard cry out, I saw Grimm leap, and a gun was discharged.

whatever else was happening. But it was no use; a job for a Nevinson, and I clambered back to the deck.

There I found the weather had moderated. The whole southwest was streaked with the orange presage of a fairer day and, right in the center of the illumination, grey and ominous, a huge cone rose steeply from the water.

"That's Puakatina," said Bronson the mate, pausing beside me. "There's an anchorage right beneath it, but we'll have to work round to the west of Cook's Bay to get shelter from the wind. I was here on a guano ship ten years ago. Damndest place you ever saw—no water, no fish, no nothing."

Morning found us at anchor in the bay and already scattering to our several pursuits. For me, Easter Island was a fairyland. Never, among primitive work, have I seen such sculpture. It far surpassed the best Egyptian work, for every one of those cyclopean heads was a portrait, and almost a perfect one. I cannot better express my feeling for them than by saying that now, as I am writing this account with the memory sharp in my mind, of the strange and terrible events that took place later, I must still turn aside to pay tribute to those statues.

After all they are not so far from my story. Indeed, it was the statues that gave me what should have been a clue—a queer idea that all was not quite as it should be on this island—an idea that I would dismiss as an afterview, were it not that I find on the margin of one of my sketches, made at the time, a note to the effect that something very curious must have happened on the island. Those stones were carved by nothing less than a race of conquerors, with stern high faces, utterly different from the easy-going Polynesians of today. What became of them?

The same impression, of some weird catastrophe, was confirmed by other members of the expedition. There were almost no fish, very little life for the botanists to chew on, and Hertford announced at one of our cabin conferences that the waters, as Agassiz had reported, were quite devoid of plankton.* He pooh-poohed the idea of the subsidence of a large land put forth by De Salza, our geologist. "Subsidence," he said, "would leave the plankton and fish untouched. It is more as though some destructive organism had swept every trace of life from the locality. All the birds and the few fish are obviously recent immigrants, like the people."

Despite my entreaties for more time to make sketches, the scientists had done about all they could with this barren land in a week or so, and we hauled up anchor for Sala-y-Gomez, three hundred miles further east, taking a couple of the islanders with us. In spite of its atmosphere of ruin and gloom I was sorry to leave Easter Island, but there was the possibility that Sala-y-Gomez might contain some traces of the Easter script or carvings, and I felt it necessary to refuse Hertford's offer to leave me and stop on the way back.

Upon Sala-y-Gomez too, we came just at evening, marking it by the white line of foam along its low-lying shores as we felt our way slowly among the reefs, and here occurred another of those trivial incidents which are straws pointing in the direction of hidden things.

I was standing by the rail with Howard, the icthyological man, idly watching the wires of the dredge where they interrupted the slow curls of water turned back by our bow when there was a heavy muffled clang, and we saw the lines of the dredge tighten to tensity. Howard signalled for it to be drawn in, and together we watched the big scoop, eager to see what it had encountered. To our surprise it held only a little seaweed.

"Now that's odd," said Howard, searching the seaweed, with a small hand glass. "I could have sworn that dredge caught something heavy."

"It did," I answered, pointing. There was a long scratch of bright metal along one side.

"Corals possibly," he remarked. "Hey, Bronson, any reefs charted here?"

The mate strolled up. "Not on the charts," he said, "but you never can tell. These Chilean charts aren't very good, you know."

"M—m—m" murmured Howard, continuing his examination. "There ought to be fragments of coralline formation here, but there aren't. Wonder what it could have been? Almost as though we'd caught something and it got away."

The thought of Hertford's comment about a destructive organism slipped into my mind, to be dismissed as not worth mentioning. Rock, shark, almost anything would have made that mark on the dredge.

There were no specimens ready to be sketched in the morning, and I went ashore with the first boat to wander about the island with my drawing materials. It must have been nearly noon when I rounded a jutting outcrop of rock to see before me a little sandy cove, placid and unresponsive in the heat, without a sign of life. Far ahead, a dark blob of rock was the only mark on the perfect line of the beach. It was so suave a scene that I sat down to make a sketch. After I had pencilled it in and was mixing the brown color for the cliffs, I noted that the rock seemed to have moved, but I attributed it to imagination and went on with my coloring. It must have been quite ten minutes when I looked up again. This time there could be no doubt—neither the outline nor the position of the rock were at all as I had recorded them.

IN some excitement, I started to climb down the cliff toward this singular rock that changed place and form, but the distance was considerable, and while I was still a quarter of a mile away, it moved again, visibly this time, sliding down to the water's edge, where it disappeared beneath the gentle surge. The most peculiar thing about it was that there seemed to be no sensible method of progress; it flowed, like a huge, irregular drop of liquid.

I hurried back to the camp with my sketch and my tale, but found the rest in no condition to listen. Old Makoi Toa, one of the Easter Islanders we had brought

* *Plankton*—the passively floating or weakly swimming animal and plant life of a body of water;—by some applied chiefly to the organisms found near the surface. (Webster.)

along with us, had been killed, apparently by a snake.

"He was fishing down the beach ahead of the rest," said Howard, "just out of sight beyond that rock. We all heard him scream, and hurried to the spot. When we got there he was already dead, with a round hole in his chest, and shortly after he turned that hideous blue-black that people turn to who die of snake-bite. It might have been one of those sea-snakes but for the size of the wound."

"I'm sure I saw something sliding away into the water," added Greaves, the botanist, "but it didn't look in the least like a snake."

The shadow of the old man's death lay on our little cabin conference that night, inhibiting speech, though the means of it remained a mystery. It was not until I told my tale that there was any conversation at all. As I finished there was a little moment of silence, during which each one made the obvious parallel between the occurrence and the death of Makoi Toa, and then Professor Hertford asked to see my sketch. He looked at it closely for a moment.

"Unless I am mistaken, gentlemen," he said, "we are facing an unknown organism of serious potentialities. May I ask that you do not go ashore to-morrow unless you are well armed and in pairs?"

"What is it, professor?" asked de Salza.

"I would prefer not to hazard a guess just yet. I may be in error." And that was the last word on the subject that we could draw from him, although de Salza laughed at the idea of anything sinister in connection with this little spot of land.

The next day was bright and clear, and after attending the burial service for Makoi Toa, I sought Greaves and together we made for the spot where I had seen the moving rock. I admit we were culpable in not going armed as the professor advised, but who would then have thought . . . .?

We reached the place about the same time I had been there the previous day, climbed down the cliffs with each other's help, and walked across the white sand of the cove, to where I had seen the moving rock. It was not more than ten yards from the edge of a place where the receding tide of years had left a number of little arched caves. Just where I had sketched the rock was a ridge of sand pushed aside by the weight of whatever had been there, and in the center of it, a round, hard ball, perhaps three or four inches in diameter. Greaves picked it up, turning it over curiously.

"Why, it's feathers and bones," he said, extending it to me, "just as though it had been regurgitated by a pelican or an eagle after a meal."

I reached my hand for it, and just then, by the grace of Providence, caught a flicker of motion out of the tail of my eye. I turned to meet it; my foot gave on the soft sand, and I fell prone. It was the fall that saved me; for something sharp whistled not an inch past my shoulder as I went down. The next instant I heard Greaves shout, and felt him tug my arm, and in the same moment something cold and clammy and hard grated and gripped against my foot. A horrible fear, the fear of imminent death, turned me to ice; I seemed incapable of movement, but somehow got to one knee, and between my own efforts and Greaves' pull, the grip on my foot relaxed. I half stumbled, half-rolled down the sand, and as I did so, there was another whistling flash and something struck the pocket of my coat, going right through the cloth and the sketch pad beneath it, to fall short of my skin by the narrowest of margins. Greaves was pulling me to my feet, and in a moment we were running.

In the interests of science I regret that we stood not on the order of our going. Neither of us spoke till we turned and paused at the top of the cliff, after a breathless climb. The cove was as empty as it had been before.

"My God What was it?" I gasped.

"I don't *know*, I don't *know*." Greaves was half sobbing with excitement. "Something big and sort of —all soft—threw those things at us—half a dozen of them—My God."

WE were both so much shaken that the journey back to the camp seemed interminable, and it was some time after our arrival before a consecutive story could be gotten out of Greaves. When he did tell his tale, it appeared that he had noticed the thing almost as soon as I—a great, dead brown object of uncertain form which had slid up softly from the water and shot out the darts I had seen without warning or sound, "as a cuttlefish does when you touch it," said Greaves, with a shudder. "The horrible part about it was that the thing had no eyes but seemed to see perfectly and know just where to move to head us off. I thought I'd never get you pulled loose . . . All the time I was dodging those darts I kept thinking about Makoi Toa. . . ."

"I think you will agree," said Professor Hertford, when he had finished his rather incoherent account, "that my anticipations have been realized. Everything points to the presence in these waters of an efficient and destructive organism, capable not only of dominating the whole animal environment, but possibly even of depopulating Easter Island. From your description, which is very rough and inaccurate, I should not be surpised to find it a giant new species of infusorian or jellyfish. Both types have those stinging tentacles. I am in favor of remaining until we obtain more data about this animal, but as some—er—danger may attend such a course, I should prefer to leave it to the majority."

What could we do in the face of such an appeal? Personally, I had felt the grip on my foot and had no desire to feel it again. I could understand the flame of scientific interest driving the others, but it was rather with foreboding than enthusiasm that I listened to the eager plans they made for entrapping one of the animals which had attacked us.

I doubt whether anybody except de Salza (who was a human fish, intolerant of anything but the record of the rocks) was absent from the group which gathered behind the top of the cliffs the next morning to watch the fluttering antics of a chicken pegged out on the sand where we had met our adventure. Howard

and Grimm (the conchologist) were armed with the only two rifles the expedition afforded, it having been agreed that it was better to examine a dead specimen before trying to take a live one.

The sun grew unconscionably hot as it swung across the sky. We conversed in low tones and were wondering whether we had come on a wild goose chase when I saw Howard beside me, stiffen to attention. I looked around—there was a break in the ripple, and through it slowly emerged the shape of the monster, dull brown in hue. I felt a quiver of excitement; the chicken was straining to the limit of its rope. There was a crack! that made all of us jump, as someone fired. "No, not yet," cried the professor, but the dark form took no notice, only moved on, formless and flowing, with half a score of short tentacles waving before it. Then it appeared to notice the chicken, paused, waved a tentacle or two at it, and there was a flicking motion as one of the darts shot out. The chicken went limp and the monster flowed gently over it. When it had passed, chicken, rope, and even the stake, were gone.

Both men were now firing, but they might as well have been throwing peas. The fantastic mound of jelly rolled back into the water in the same leisurely fashion it had come out, and disappeared.

Everybody began to talk at once, "The thing must be bullet proof!" "Inverterbrate, but what an inverterbrate!" "So that's what cleaned up Easter Island!" "Did you notice the ossicles?" "It's a hydroid!" "More like a medusid." "What do you think. Dr. Hertford?"

On one thing the conference that followed was agreed: that the animal, whatever it was, must be captured and examined. Various wild suggestions about dynamite and chemicals came up to be laughed down, and it was Dr. Hertford, as usual, who supplied the determining factor.

"It seems to me," said he, "that it would be worth while to postpone our trip to the continent and attempt to take one of these animals in one of the mammal cages. I believe the one you shot at was at least seriously injured; it seems incredible that it could be altogether bullet proof. We may, therefore, have a wait before another appears. What do you say?"

De Salza's was the only dissenting voice. I kept silence. I wish I had not, for though my protest might have done little good, it would at least have taken a load from my conscience that can never be quite clear now. However, I made no protest. The cage was rigged up on the shore with another chicken inside and a trick arrangement to slam the door shut on the invader and we sat down at the cove to wait.

IT was the afternoon of the third day from the installation of the cage, and I was in my tent at the camp, trying to capture the color pattern of a small and very wiggly fish when the excited voice of Howard hailed us to announce that the cage held a prisoner. At once everything else was forgotten and we all hurried off, pell-mell, Dr. Hertford for all his years, well in the lead.

Sure enough the little mammal cage was filled to overflowing with the brown jelly-like mass of the monster, a tentacle or two waving in a friendly manner from the edges of the mass where it bulged between the bars. I admit it gave me a gone feeling in the pit of the stomach to watch it; it was like nothing I had ever seen or heard of, but among the scientists it produced only the liveliest interest.

Warned by previous experience, they approached it with some caution, Howard carrying a piece of sheet iron from the ship before the professor like a shield-bearer in the days of the Iliad, while Greaves and Grimm came behind at a respectable distance, bearing rifles at the ready.

As they drew near, I heard the professor cry out in excitement, "Why, it's a protozoan! Look, the nucleus, and those cilia! And the triocysts! A single celled animal, by all that's holy! Related to *Loxodes* unless I am mistaken." Simultaneously, Greaves and Grimm, attracted by his words, drew a step nearer, and even Howard lowered the sheet iron to peer at the animal. And in that moment it happened.

With an indescribable swaying motion, the jelly-like mass in the cage seemed to surge through the narrow opening in the cage, and as it surged, the air about it was filled with the flash of those deadly darts. I heard Howard cry out, I saw Grimm leap; a gun was discharged, and the sheet iron clanged on the sand. Then there was silence and the brown mass in the cage oozed slowly across the sand to the four dead men, who writhed for a moment and lay still.

I think I must have gone a little mad in the next moments. I can never recall quite accurately what happened. I remember only a paralyzing mist of horror, and the walls of my cabin. They tell me that the cove was found utterly empty save for the cage with its door shut tight . . . I do not know . . . I do not know. A round ball, like the gall of feathers and bones found by Greaves was picked up later on the beach. It held shattered human bones, a fragment of blue cloth and a brass key, nothing more. I did not see it.

Even today, the memory of the horror of that moment gives me sleepless nights and days of shuddering. All too clearly I recall the words of that brave and gentle man who went to his death on the beach of Sala-y-Gomez, "When a type to replace man appears, it will be a direct evolution from the protozoa. . ." All too clearly I remember his last words, and the desolation wrought by these animals on Easter Island and through that great stretch of the Eastern Pacific known as the Agassiz triangle, and I wonder how long it will be before they invade the continents.

It will be long, of that I am certain. The length of the time makes me wish to forget it and leave the future to care for itself. But I feel it a duty to the memory of Dr. Hertford to lay aside my own feelings and place this story before the public, especially since de Salza, the only surviving member of that disastrous expedition, has cast doubt upon his conclusions and has disparaged his memory. If, in the face of a de Salza's reputation, I have succeeded in convincing even a few that humanity is on the verge of a battle to the death with a perhaps superior form of life, I am content; I have accomplished my purpose.

THE END.

The Space Hermit

By E. Edsel Newton

(*Continued from page* 333)

at her, looked about for the professor whom I saw engaged in tending a machine in the after end of the ship, and then turned and whispered, "Do you wish to land?"

She nodded eagerly. My very soul shuddered when I saw her nod. It seemed that she was broken in spirit and had no reason to live, but only smiled through her tears and waited patiently for a rescuer. I hoped that her mind had not been affected by the great trial she had faced. I wondered that she appeared so much at ease. Perhaps it was through hope, perhaps, like too few women, she had been alone long enough to discover within herself her greatest powers.

"Do not worry—your father shall be safe," I whispered again.

She nodded and beamed upon me as I turned away. I knew then what to do. I would make arrangements to land the ship. So I went to my room and drew down the curtains. I removed my clothes from my body and put my shirt and underwear in the pockets of my flying suit, which I put on again. Then at leisure I tore the clothes I had removed into strips and tied them together at the ends. By this means I contrived a strong bandage the width of an inch and about seven feet long. Then I took a pair of pliers which were in the pocket of my flying suit and tore the bolt from my door. No sooner had I succeeded in doing that than the professor turned from his work and came down to see me. He talked like a tired, weary old man.

"I am not so strong as I once was, Metters. I shall ask your assistance in lifting one of my motors from its base. It will be repaired later—just help me remove it."

I felt like a murderer as I followed him out through the control room to the room where the motors were located. We were in a narrow passageway when I pinioned his arms to his sides and quickly tied the cord. Before he could wrench himself from my grasp I bent his body and wrapped the cord about his feet. I secured him and lay him on the deck, but I could not face him. I heard him breathing quick and short as a man meeting certain death, and then he said, "You are a traitor. I should not have trusted you."

"It was necessary," I said, and then I looked into his face. It was the face of a man who awaited a tragedy—in his case, obviously his return to earth.

"Never!" he hissed "Never, Metters, shall you take me back to your hateful world. My daughter—"

His voice fell short. He tried to wrench his hands free, but only succeeded in rising to a sitting posture. He tried to speak, but he failed.

IT must have been his heart. I loosed his bonds and bathed his head in cold water. Nothing seemed to help. I could not bring him back to life. An hour later, when I was still working over him, Glorie came to my side. She fell beside him weeping. It was the first time I heard her voice.

"It was his heart, Miss Hedron," I said

"It must have been," she answered tearfully. "I—I saw you bind him—I do not believe you wished to injure him."

I put my arm about her and guided her into the main cabin. I did not wish to discuss matters with her. I pulled down the elevator lever and turned on the power. Thirty minutes later I looked through the darkness to see the lights of what appeared to be a small town. I called Glorie who stood waiting and glancing back at the body of her father. She followed me aft to a door that had been sealed for three years. I took my pliers and wrenched the seal from the latch and opened it.

"When I strike land, you must jump, Miss Hedron," I directed. "I will follow immediately after you."

"But you will let the ship go again?" she asked.

"If you wish," I told her, caring only to be on land.

"Please do, it belonged to him—he wished to be buried in the air—that way."

It was the end of my cruise on the "Glorie," I pulled the ship to level a few feet from the ground and then dipped her until I felt her strike. I saw Glorie jump from the door. I closed the door of the engine room where the body lay and quickly followed her. The moment I touched ground I saw the great phantom heave and lift into the void, back to the upper strata, back to the sky where she belonged, bearing her dead burden. It was then that I wished I had secured the formula for making the metal of which that ship was built. But I was concerned with something still more important. Glorie stood waiting for me. She was like a helpless child, and still is, for the world is strange to her.

We went into the town, which proved to be a village in Canada, and wired my bank for funds, upon receipt of which we started out for Los Angeles, my home. We have been on earth two weeks. I do not know what will come of our adventure. Suffice to say I am trying to make the world believe our story, which has been proved to many beyond doubt. My Hamilton was found in the northern part of the state. Salls is backing me up. But a certain newspaper is trying to make light of our story. It may mean that I must again cruise through the upper strata and search for the great "Glorie," despite the fact that I have Salls and the builder's daughter to bear me out. But I do not know. I have a certain feeling of responsibility for Glorie, and a great respect for her wishes—and I am therefore inclined to let the craft remain up there in the ether, a glass tomb of the strangest and greatest scientist the world ever produced.

THE END.

The PURPLE DEATH

By Jack Barnette

YOUNG Doctor Bernard Grey spent many hours bending over his microscope, studying intently the bits of life that its lens made visible to his eye. Usually his lens was trained on a few of the spiral shaped microbes discovered in 1906 by the German zoologist Schaudinn. Schaudinn named these microbes "Spirocheta Pallida" and proved that they were the cause of that dread social disease that is the reward of sin.

Grey knew that Schaudinn had discovered these pale germs that darted and corkscrewed their way across their little world beneath his lens. He knew of the work of Paul Ehrlich. He had read of Ehrlich's eight years search for something to kill trypanosomes—those wriggling, finned devils, who, if one includes all branches of their family, are the cause of the dread sleeping sickness, nagana and other diseases. He knew of David Bruce's lifetime battle with the trypanosomes and with the Glossina Morsitans and Glossina Palpalis—tsetse fly carriers of nagana and sleeping sickness.

Grey idolized those men whose life history was recorded in Paul de Kruif's book "Microbe Hunters," which held a prominent place on his desk. He, like the brilliant Ehrlich, dreamed of conquering trypanosomes and the spirochetes that Schaudinn claimed were closely related to them. He had, in his few years of practice, administered many doses of 606, or salversan, which was the fruit of Ehrlich's years of research, and he knew that though salversan saved thousands from death, insanity or worse — it occasionally killed, seemingly without reason.

Ehrlich had searched for a dye that would be harmless to man but would kill the microbes that attack man. Grey, in this day of the ultra-violet ray, sought a light ray that would do the same thing.

"See, see," he would say to his friends. "If I could find a ray that would kill microbes without in any way affecting the human body—I could cure any germ disease. I could cut an artery, insert a curved quartz tube in such a manner that the blood would continue to flow through the artery by way of my tube. Then, while the heart pumped the blood through the tube, my ray —focused on the tube—would in a short time free the blood of microbes. Perhaps the ray would be powerful enough to pass through the body—X-rays do—then I need not cut at all. Just by exposing the patient to the ray, I could free his entire body of microbes.

Grey's laboratory was a maze of apparatus, a hodgepodge of all kinds of lamps and projectors. He tried all kinds of rays on the germ cultures on his microscope slides, and on inoculated white mice and guinea-pigs. He found that two frequencies in the ultra-violet range would kill a few of the weaker microbes, but the infinitely small, thin, curved tubercle bacilli, the spirochetes, the trypanosomes and other of the more hardy and malignant germs, were not in the least disturbed by these rays, and they killed Grey's mice and guinea-pigs.

Grey, however, was not discouraged. He had a good practice that supplied him with money. His rich friend, George Le Brun, an electrical wizard, who spent his time designing and building outlandish apparatus for Grey's experiments and getting hilariously drunk on the contents of a well stocked pre-prohibition cellar, aided and encouraged him.

Grey's day of days was coming—or perhaps it would be better to say his night of nights. Le Brun had put the finishing touches on an odd piece of apparatus intended to permit the variation of the vibratory frequency of the rays given off by a new tube which he had designed, and had that day received from a company which specialized in making that kind of experimental apparatus. He worked until after midnight installing this new tube, which looked like an X-ray tube that had suffered from convulsions.

Grey and Le Brun looked forward to the trial of the tube the next day. Wonderful things were expected of this new apparatus and, though they had often been disappointed, they were very anxious to test the new ray.

Now it chanced that the next day was Friday the thirteenth. All sensibly superstitious people know that Friday is an unlucky day and nothing new should be attempted or started on that day, and when it chances to be that Friday is also the thirteenth—then anything begun on that day is doubly certain to turn out wrong. Perhaps Le Brun and Grey were not sensibly superstitious or maybe they felt that the trial of this new tube was mere routine—just another attempt to find

HERE again, is a different sort of a story—different as it is unusual and as unusual as it is excellent. We know so little about our unknown and little investigated rays and waves, that almost anything seems possible.

Quite recently, Dr. Coolidge of the Great Electric Company, experimented with a new ray by means of which startling experiments were made. These rays changed the color of a rabbit's hair. The subject is given in SCIENCE AND INVENTION, *December,* 1926, *p.* 690, *with numerous illustrations, and with a full description of the details.*

The sunlight streaming through the hole where the window had been made a large square of light on the concrete floor of the laboratory. Into this square of sunlight Grey rushed; tried to stop and turn, at the same time shrieking to LeBrun.

that elusive something for which they had already spent two years searching.

Friday the thirteenth dawned through a sullen, drizzling rain that was to last all day. Nine o'clock found them both in Grey's laboratory. Grey had arranged with a colleague to handle his practice for the next few days; had instructed his secretary that he was not, under any circumstances, to be disturbed and he and Le Brun had locked themselves in the little two-room building in the rear of his house. This building contained Grey's study and laboratory.

BOTH the doctor and Le Brun were visibly excited as they stepped into the lead-sheathed X-ray control booth in which the control boards for all the apparatus were located.

A switch clicked—a knob turned beneath Le Brun's fingers and, while Grey and Le Brun watched through the thick window of the booth, a pale blue halo grew around the tube. Swiftly it changed to a deep purple haze that crept and writhed like smoke in a faint breeze. Le Brun cut off the current and the purple haze died out. Grey left the booth and placed a cage containing some white mice and a guinea-pig directly beneath the "Le Brun tube" where they would be fully exposed to the "El rays." (They had decided to name the tube after Le Brun, who designed it, and its rays after the first letter in his name, El.) Grey then returned to the protection of the control booth—they did not know what effect the rays of the Le Brun tube would have on animal life.

For two hours the sinister, creeping, purple haze crawled over the surface of the Le Brun tube and its rays poured down upon the guinea-pig and mice as they sat blinking at the strange light.

Grey and Le Brun carefully examined the mice and guinea-pig but they seemed to be absolutely unaffected by the El-rays. Satisfied that the rays were harmless to animal life, and therefore to themselves, they began to turn the rays upon germ cultures.

The day passed quickly and neither Le Brun nor Grey thought of lunch. Their ray was killing germs. The longer the exposure the more germs it killed. The blood of a guinea-pig which Grey had inoculated with tubercle bacilli some weeks before—showed only dead microbes after the guinea-pig had been exposed to the purple light for two hours. Watching germ cultures through the lens of their microscopes, Le Brun and Grey could see a sudden cessation of activity among the wee creatures. They would fade and die. Only the hardy, wriggling trypanosomes and their virulent cousins, the spirochetes, continued their activity, stubbornly refusing to pay any attention to the rays from the Le Brun tube.

Grey and Le Brun stopped to eat about half past seven that Friday evening, but were back at work in an hour. It was about eleven o'clock, just as they were about to stop for a little well-earned rest, that Grey—watching a germ culture of spirochetes through his microscope—picked up a tiny ultra-violet ray projector and directed its beam, scarcely as large as a pencil, at the slide on the stage of his microscope.

As he watched through the microscope, the microbes and slide disappeared. Grey, tired and sleepy, annoyed because he thought his lens were out of focus, swore softly. A glance, however, showed that the slide was gone, that half of the stage and the substage condenser were also missing. Grey swore again—this time in sheer amazement. The ultra-violet ray projector in his hand was sending its invisible ray at the slate top of his laboratory table. Grey glanced at it and then pointed it at a tiny test tube of water. The test tube and its contents vanished. Grey pointed the projector at the wall and a black line marked the course of the beam as it moved across it. By this time Grey was far too amazed to swear.

Le Brun—at another table—was unaware of what was happening. Grey switched off the projector and stood thinking. He had used that ray projector a hundred times before and it had never caused any such extraordinary occurrences as these. Must have been the combination of the two rays. Perhaps it only made things invisible. He moved his hand through the space where the test tube had been, but touched nothing. He walked across to the wall and examined the gash that the beam of ultra-violet light had left in it—a clean cut through the composition wall board to the hollow tile of which the wall was made. Returning to the table, he placed a cage containing a white mouse on the slate top of the table; pointed the ultra-violet ray projector at the slate top, switched it on and moved it in an arc that crossed the cage and the head of the mouse. The cage was cut in twain as if by an invisible knife. The head of the mouse vanished and its quivering body lay bleeding on one side of the cage. A few more passes of the little ultra-violet ray projector and both mouse and cage had vanished as if under the influence of a magician's wand.

Going to the control booth, Grey shut off the Le Brun tube, turning to watch it as the purple glow faded. Then he went into his study and brought out some white mice that were in there. He placed one of the mice on the slate table-top and turned the ultra-violet ray projector on it. The mouse scurried around, wrinkling his nose at his surroundings, quite unharmed by the ultra-violet rays. Shutting off the projector he put the Le Brun tube into operation again, then directed the rays of the little projector at the mouse. The mouse vanished instantly.

Gone were all thoughts of microbes. Grey was like a child with a new and wonderful toy.

"Look, George," he called to Le Brun, who was tinkering with some apparatus.

"In a minute—soon as I get this vibrator adjusted."

"Damn your vibrators and coils! Man, I have just made the greatest discovery of the century."

Le Brun dropped his tools and hastened to Grey. Under the rays from his tube and the little ultra-violet ray projector he watched Grey send more mice and a couple of guinea-pigs into nothingness. A steel bar was instantly severed, then by passing the ray along the bar, Grey caused it to follow the mice and guinea-pigs.

"Just think!" he said to Le Brun. "Imagine what a step forward this will be in surgery—in mechanics. I

can amputate a limb instantly. Compared to this an oxy-acetylene cutting torch is as slow as a cold chisel and hammer would be compared to the torch.

"Imagine it in warfare—a beam of the El-rays from your tube and a beam of ultra-violet rays sending an army into eternity. An invisible knife that would cut airplanes or battleships in twain as if they were made of cheese. So far, slate and clay are the only things that I have found to be impervious to it."

"It's wonderful, amazing, unimaginable. But I can't understand it, Grey. Why does the ultra-violet ray cut only when in combination with the El-rays? Where do the mice and guinea-pigs go? They leave no smoke, visible gas or any odor, so they do not burn. They simply vanish. It must instantaneously reduce them to atoms, perhaps to the protons and electrons of which the atom is composed according to Bohr."

"Yes, I suppose so. Let's go to bed. My head is in a whirl. To-morrow I must experiment to find how I may use this discovery for surgical operations."

That night Grey dreamed of performing all kinds of surgical operations on the inside of the body without making any incisions. He awoke with a vague memory of using the two rays in the form of tiny beams to perform those dream operations. He understood how he could remove—say an appendix—by causing the two rays to cross each other just at the appendix, but he could not remember how, in his dreams, he had been able to see the rays inside the body, or how he had completed the operations after removing the offending organs.

Outside the sky was heavily overcast but the rain had stopped. It was half past eight and the housekeeper had breakfast ready. Grey woke Le Brun and they snatched a light breakfast and hurried across the yard to the laboratory.

IN the laboratory, a few more mice and guinea-pigs passed away beneath the combination of rays. A cat and a dog lost their tails. Under the rays went metals, wood, liquids, paper, bakelite, everything that Grey could lay his hands on, and all, except a bit of concrete, articles made of clay and the slate of Grey's table-top, vanished.

About noon the clouds broke away and the sun shone brightly. The first intimation that Grey and Le Brun had that all was not well was given by a strong draft of air and a crash of glass and wood as a part of the window and its framework disappeared and the rest fell into the laboratory.

Grey, failing to comprehend what was happening, rushed to the window. The sunlight streaming through the hole where the window had been made a large square of light on the concrete floor of the laboratory. Into this square of sunlight Grey rushed; tried to stop and turn, at the same time shrieking to Le Brun:

"Shut off the tube—ultra-violet rays in sunli—Ahhh!"

Even as Le Brun looked, Grey's legs, bathed in sunlight from the knees down, vanished, and the upper portion of his body, turning away from the window under the impulse of the effort made as he stepped into the square of sunlight, fell into the sunlight that entered the window at an angle from above, and it, too, disappeared. Vanished—with the lower portion always going first, so that Le Brun's last glimpse of his friend was of his head, face contorted in agony and amaze, falling toward the floor, yet vanishing before it touched. Hurled into nothingness, just as the mice and guinea-pigs had been, by the rays from the Le Brun tube and ultra-violet rays; ultra-violet rays from that greatest of all ultra-violet ray generators—the sun.

Rushing to the control booth, Le Brun shut off the tube that bore his name. Then, as full realization of the tragedy came to him, he fled from the laboratory.

Perhaps it would be best to say that he started to flee from the laboratory, for as he rushed from the little building into the sunlight, he, too, was hurled into eternity even as Grey had been. Mandy, Grey's colored housekeeper, who was coming across the yard to call them to lunch, vowed ever afterward that:

"Mistuh Le Brun's ghos' rushed out ob de do' and vanished right befo' mah naked eyes."

What Grey and Le Brun had failed to learn was that the rays from their new tube caused some intangible change in matter that made it susceptible to dissolution by the ultra-violet rays for an indefinite period, and not, as they believed, only while under the combined influence of both rays. Grey died because he failed to remember that the sun radiated ultra-violet rays.

Mandy's version of Le Brun's death gave the little building a reputation of being haunted. The experience of the hard-boiled but surprisingly superstitious policeman, who, while investigating the disappearance of Grey and Le Brun, found Grey's notebook and stepped into the sunlight to read it—only to have it vanish from between his fingers—served to add credence to wild rumors concerning the place. Further corroboration was given by the hair-raising experience of the four workmen hired by Grey's sister to remove the furnishings from the laboratory and study.

These men, filled with forebodings by the tales told about the laboratory, were rather shaky at first, but regained their confidence as they removed Grey's desk, couch, books, chairs and other effects from the study. Joking as they entered the laboratory, they removed the Le Brun tube apparatus—a mass of tubes, coils, meters and other electrical equipment, mounted on a huge bakelite panel. This apparatus weighed well over a quarter of a ton and taxed the combined strength of the four of them to carry it. Out through the study they staggered with their unwieldy burden; out on the sidewalk and into the sunlight. Then a moment of awed silence—the mass of apparatus had disappeared, leaving them empty handed. The four men stood regarding the empty space between them for a second or two, then with one accord they turned and fled incontinently, bumping into other pedestrians who turned to hurl curses after them.

This ended all attempts to remove the contents of the laboratory. The place was shunned except for the occasional venturesome fellow who, with his scalp tingling and with cold chills chasing each other up and down his spine, would creep into the study just to im-

press an awe-stricken audience with his bravery. Members of Mandy's highly emotional and superstitious race when passing this haunt of ghosts felt of the left hind-foot of a graveyard rabbit, or whatever charm against supernatural evils that their pockets contained, and felt strangely comforted.

The summer sun—shining into the laboratory through the gaping holes that had once been the windows in the east, south and west walls—gutted the walls opposite the windows, dissolved any pieces of apparatus that its rays chanced to fall on and, with the aid of its elemental allies, the wind and rain, soon turned Grey's once well-kept laboratory into a shambles and then into a ruin.

Heavy storms ripped the slates from the roof and today only a ruin of crumbling walls remains as a shunned and desolate monument to Grey and Le Brun and to their strange discovery.

THE END.

In this department we shall discuss, every month, topics of interest to readers. The editors invite correspondence on all subjects directly or indirectly related to the stories appearing in this magazine. In case a special personal answer is required, a nominal fee of 25c to cover time and postage is required.

INTERPLANETARY STORIES

Editor, AMAZING STORIES:

AMAZING STORIES is a very interesting magazine; it is in fact, about the only story magazine that does interest me at all. All the stories are interesting, but in particular I am interested in "Interplanetary Travel" stories. Why, I do not know; most of them are such impossible imaginations of their writers—huge beasts, highly developed intellectual animals or insects, and other impossible (?) things. And above all, most of the writers have no idea of how it is done, or else they use the "Goddard Rocket."

But to get down to cases:—I have spent several hours today going over these stories trying to dig out of them something of benefit as a starting point, and it is not there.

"Rice's Ray" by Harry Martin, January 1928. This writer apparently assumes that gravity is like a current of electricity and can be increased if a perfect conductor can be found. Granting that such is the case, it is not a safe method of travel and I do not believe it.

"Sub-Satellite" by Chas. Cloukey, March 1928. Rocket principle.

"Skylark of Space" by Smith and Garby, August, 1928. The best interplanetary story ever written. The science in it is beyond criticism except for the method of propulsion. "X" always means unknown. So at the beginning they fail. And atomic power is doubled by some authorities. This story illustrates the necessity of control of gravity itself, as this would eliminate the danger of large planets or dead suns.

"Ambassador from Mars" by Harl Vincent, September, 1928. Just a story as far as space traveling is concerned.

"To the Moon by Proxy" by J. Schlossel, October, 1928. Goddard Rocket.

"Moon Men" by Frank Brueckel, November, 1928. Stay with it Frank. At least you have tried to explain your method. But guess again. "Centrifugal force" explains the action of a whirlpool.

"Flight to Venus" by Edwin K. Sloat, December, 1928. Goddard Rocket.

"Mernos" by Henry James, February, 1929. Goddard Rocket.

"The Second Swarm" by J. Schlossel. Quarterly, Vol. 1, No. 2. A big story full of guess work with some possibilities but no method of travel that even looks possible.

"The Gravity King" by Clelland J. Ball. Quarterly, Vol. 1, No. 4. The right idea but no attempt at details. Do a little studying C. J. You can't make a scientific story without "science."

"Ralph 124 C 41+" by Hugo Gernsback, Quarterly, Vol. 2, No. 1. A good story full of science and at that, science that will very probably become reality in the future. But how about the gyroscopic principle for overcoming gravity? The principle of the gyroscope is one of opposition to rotary motion and not to movement of the machine as a whole. This cannot be used to overcome gravity.

So much for those who write better interplanetary stories than I can even imagine. My analysis is only to find something which might lead to a practical application. All the methods suggested look like so many mirages to me, with the exception of the Goddard Rocket, and even the scientists admit that it is not practical in its present state due to the lack of a sufficiently powerful explosive.

Let's conquer gravity first, then we can go to any planet we wish to, large or small, with safety. When we can eliminate gravity, so an object will float in the air, no matter what its density, then we will not need to worry about power.

How is it to be done? Well, my guess is as good as the next one. By the proper application of electricity. Perhaps not the electricity as we know, but some form of what we call static electricity. What makes one's hair stand on end when he passes under a large belt that is statically charged? You say static electricity. Its attractive force overcomes gravity. When we can take such a fact as this and reverse its action, perhaps we may conquer gravity. It is worth thinking about.

I am cataloguing all possible methods and as soon as I can get to them, I intend to try them out.

If there is any one with me in this attempt I will give them the result of my work.

Give us all the interplanetary stories you can, especially if they even hint at how it may be done.

Donald Tearle,
2676-77th Avenue, Oakland, California.

(Interplanetary stories involve what seem to be impossibilities. The distances are so great that acceleration of such a high degree would be required to get the travelers in their vessel going at adequate speed, but they would be almost crushed and perhaps killed by the action of the acceleration on their bodies. If Mr. Goddard had ever ventured to go off in his rocket we doubt if he would have been killed by the descent—we think the acceleration would have taken care of that feature. But many of our readers want these stories. They have a nice touch of science about them, so that we feel that it is our part to continue giving them in our columns.—EDITOR.)

THE ASCENT OF A BALLOON AND TIME TRAVELERS

Editor, AMAZING STORIES:

It is certainly unnecessary for me to express my enjoyment in reading your wonderful publication—although I do believe the magazine is worthy of being printed on a better grade paper.

Einstein's theory of gravity has set me to thinking about gravity—I would like you to assist me, if possible, with the little problem confronting me. It does not refer to Einstein's theory directly.

Gravity, I understand, has hitherto been accepted as being entirely separate from air pressure. Am I not right?

Newton said, "Why does it fall?"—here's a new one—"Why does a 'lighter than *air*' balloon go *up*?"

What has the air pressure to do with the gravity not pulling the balloon down?"

Yes, water floats objects that displace their weight, but that is because the pressure of the water is more than the pressure of the air, and mainly because the pressure is from *beneath* the object. But in the air—the pressure is from above as well as from below.

As an experiment—an object placed in a vacuum is still attracted by gravity. Why then is not the lighter than air balloon attracted the same way when the air pressure outside the balloon presses on *all* sides the same? Surely air pressure does not hold the balloon up, for is it not pressed down as much as up? Can it possibly be that the earth *pushes away* a lighter than air object? But this cannot be so—for when the balloon reaches a certain height, it rises no more. Please explain this for me.

In reference to your time stories: Suppose a man, at 3 P. M. February 19th was sitting at his table writing. Then, on some future date he travels back through time to February 19th, 3 P. M. He would meet himself, would he not? But on February 19th at 3 P. M. if he did not meet himself, how in the world could he, at some future date have come back through time then? Or, let's take the future. Suppose a man say in 1776 had perfected a time machine and proceeded through time and arrived here in 1929, and then, he returned to 1776. Would that mean that at night this very minute, in 1929, that same man is living, in 1776? But how could that be when that man is not living at this minute? Right this minute he perhaps lies rotted to dust!

I hope I have made my points clear—they *are* difficult to explain.

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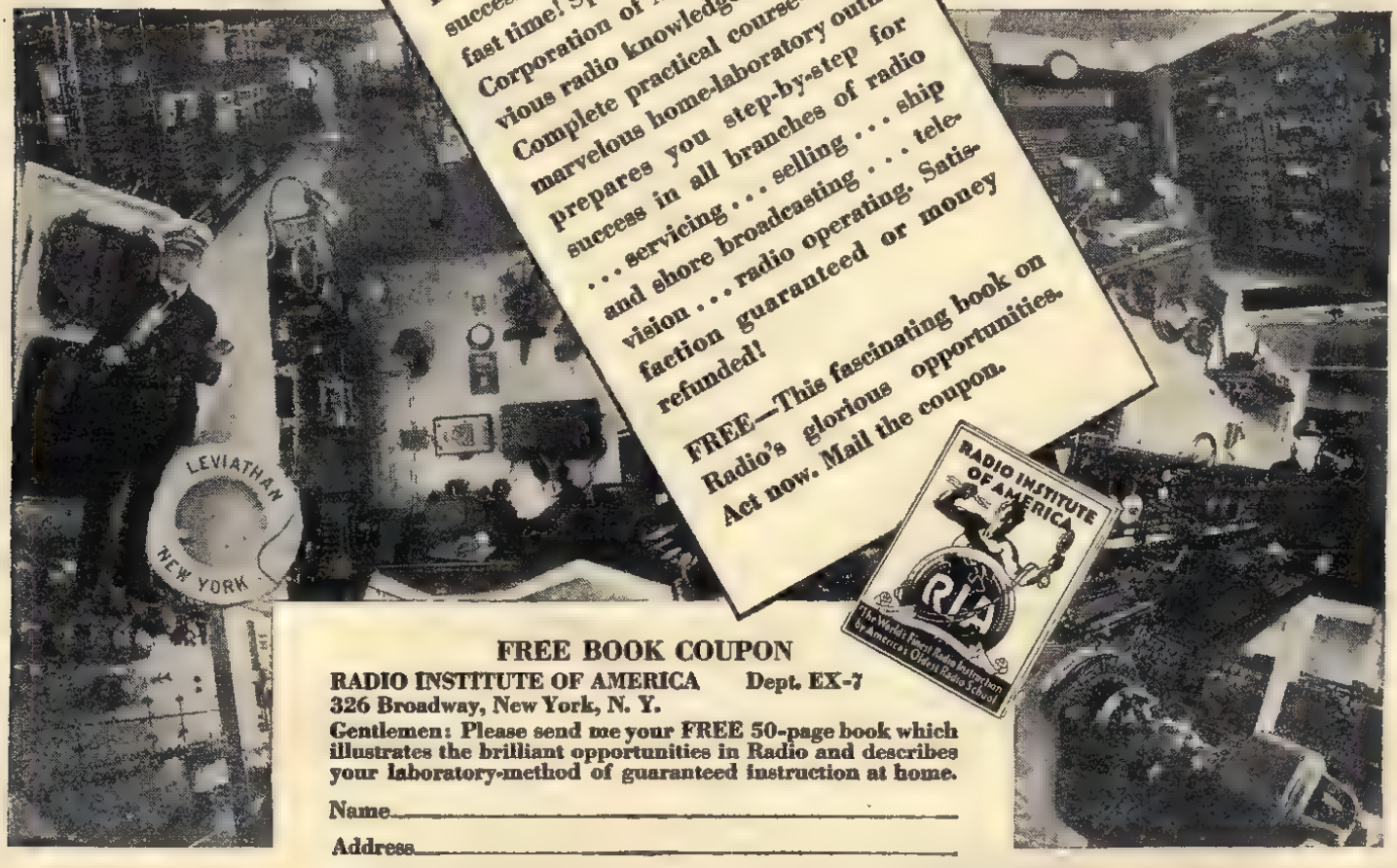

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2400 Fresbury St., Baltimore, Md.

(Gravity is entirely distinct from atmospheric pressure, but it is gravity which makes the atmosphere press on all objects. The pressure which air exerts on any surface depends on the distance of that subject from the earth. As it is a fluid, it presses equally in all directions at the same levels. The top of a balloon is further from the earth than its bottom. The air presses up against the bottom of the balloon with more pressure than it exerts in a downward direction on the upper surface; therefore the balloon ascends. It is exactly the same as holds in the case of a floating body immersed in water, the water presses down upon the immersed object less than it presses upwards against it and hence the object rises. As the balloon rises the air becomes lighter so that after a while it reaches the place where it is in equilibrium. The air presses it up as it did before, but the air is so light that it does not press it upward enough to make it rise any more. We admit cheerfully your objections to the possibility of man traveling in time without involving contradictions, but the topic does give good stories.

We welcome stories by new writers.—Editor.)

SUGGESTION FOR THE FORMATION OF A CORRESPONDENCE CLUB

Editor, Amazing Stories:

It seems to me that it would be a good plan if the readers of Amazing Stories would form a correspondence club.

We often see letters in the "Discussions" column which we would like to answer. Yet to send them to the magazine means at least a month's wait. To carry on a debate or discussion by such means would be impractical since two months would elapse between question and answer.

Now if several people took it into their heads to write to the author of one letter he would have some trouble answering all. I would suggest that the letters be numbered. Anyone desiring to answer one could then write to the editor for the address of the author. The editor would give this to the first three inquiring, let's say. There would then be no danger of swamping one person.

There seems to be a deal of discussion over the cover. This is a minor detail. Constant readers will not give up the magazine because of its outer appearance. Why do they raise such a flutter?

G. Joseph Griffin,
3215 North Fifth St., Philadelphia, Pa.

(Whenever possible we give the full address of the writers and it is almost a hope with us that this system of giving the address will lead to private correspondence. Do not hesitate to write to these friends of ours, and we are sure they will be very pleased to get your letters.

The cover of Amazing Stories may be considered a minor detail, but we can assure you that a great deal of thought is lavished on it, and we are convinced that it would be poor policy to change the cover except by very slow degrees. We cannot afford to lose readers who are familiar with Amazing Stories.—Editor.)

SOME WORDS FROM NEW ZEALAND

Editor, Amazing Stories:

I hope you will be pleased to hear from a reader at this long distance. Your magazine is attractive in cover and in the general thrilling nature of its yarns. The authors of the stories must have wonderful imaginations, something like the author of "The Swiss Family, Robinson." Fourth dimension has one stumped. However, interludes help.

Keep Amazing Stories in the press. They do not have to be scientific always to be true to the name of the magazine. Some yarns of Egypt would be welcome. Give the U. S. A. a rest if you want to keep foreign readers. Each story practically is in Yankee territory, with very few exceptions.

With all your science, few stories give any idea of human clairvoyance, telepathy and theropeutical hypnotism. It is all mechanically done. Why?

By the way, if the hero of the Skylark story really carried a pound of radium in his pocket, I pity him.

Tasman J. Lovell,
c/o Y. M. C. A., Wellington, New Zealand.

(Comments from the Antipodes are always very welcome. Madagascar, Africa, South America, The Arctic regions, the Antarctic regions have all figured in many of our stories, and certainly, the interplanetary stories have their scene in the most foreign kind of lands.

A pound of radium would be a disagreeable pocket companion unless it were adequately shielded, and that of course would make it quite heavy. But perhaps the author forgot to tell us about the metal that lined that pocket.—Editor.)

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"INTO THE GREEN PRISM"

Editor, AMAZING STORIES:

I want to tender joint congratulations to you, your publication and to one of your authors, Mr. A. Hyatt Verrill.

There have been very few issues of AMAZING STORIES which I have missed. There have been still fewer of its stories that have failed to give me more than pleasure in the reading, but the last story by Mr. Verrill, "Into the Green Prism," has surpassed them all.

In my humble opinion it is a masterpiece of literature in every respect. Its composition is impeccable. It is the acme of imagination tempered by a broad knowledge of varied subjects and, above all else, it is something that makes us stop and think. Most of us, in a vague sort of way, know that under the microscope, there are undreamed of wonders—wonders that have no place in our common, every day life except, as we occasionally think of "microbes" or "bacteria." Mr. Verrill brings to us the thought: that which in its infinite wisdom was able to create everything. As we know it, the universe in its vast intricate system, its varied Flora and Fauna, from its most gigantic to its smallest microscopic size, may have been, for reasons or from causes unknown to us, created on a scale so vast or so minute as to be beyond the limits of human realization."

We are incapable of conceiving a race of human beings, our equals, physically and mentally, dwarfed to the size of those portrayed by Mr. Verrill. Still, is there anyone who, with authority, can say, "It is impossible!" Improbable, I grant. Still, when we say impossible we place ourselves on a higher creative plane than that which did create what is, as we know it.

There is only one criticism I have to make to Mr. Verrill's "Into the Green Prism." It is reminiscent of a story published several years ago entitled, "The Lady or the Tiger," name of author forgotten.

There is, I believe, in practically all of us, even the most mundane and prosaic, a streak of sentiment that causes us to rebel at an incomplete romance, such as "The Lady or the Tiger," or "Into the Green Prism."

Instead, we want to see the romance brought to a happy culmination. Therefore, I suggest Mr. Verrill, through Don Alfeo, will make discoveries that will enable us to know Ramon succeeded in his attempt to join his Sumak Nusta.

Failing in this, he leaves incomplete the play of human emotions he has so ably portrayed.

It is like stopping in the middle of a stanza of exquisite sweet music. It leaves us waiting, expectant for that which we know should follow but which somehow, we have lost.

Again, my heartiest congratulations to Mr. Verrill. Keep it up.

Regarding the controversy that has been raging in the "Discussions' department, about the cover designs:

Personally, it was this that first brought AMAZING STORIES to my attention and caused me to purchase my first issue. And why not?

Its stories are out of the ordinary. They are "Amazing" stories of things beyond the pale of every-day life, so why not have the cover conform with the contents, "Amazing?"

To change it, to make it drab and commonplace would be like putting a super—and priceless engine in the chassis and under the hood of a pile of junk, then expect people to marvel at something they could not see.

Leave them as they are or if they *must* be changed, then make them more "Amazing."

C. E. Foster,
531 Riverside Avenue, Jacksonville, Florida.

(We are very glad to publish your letter anent Mr. Verrill's idyllic story about the little Manabi Indians. To be good, a story as a rule should picture distinctive characters, and Mr. Verrill certainly gives us a good characterization of the two main actors. From beginning to end the story has atmosphere. Mr. Verrill is an explorer and is very familiar with jungle life in South America.

You speak favorably, we are glad to see, of the name of our magazine, and of its cover. AMAZING STORIES has made a very great success and has a large circulation, and it would be a very critical matter to change the name, which is now getting to be a household word among a large circle of readers. As regards the cover pages, our effort will be to make them at once, correct and artistic. Correctness is essential, for so much is in them that is scientific in the way of apparatus, and prehistoric plants and animals, and the present day features of the universe have also to be taken care of. "The Lady or the Tiger," is about the most famous story of the humorous writer, Francis Richard Stockton. It appeared in 1884.—EDITOR.)

They Could Hardly Believe Their Own Ears---When I Switched to Ground Wave Reception!

"It's no use trying to listen in tonight," said Bill as I took his hat. "Jane and I tried to get reception during dinner but all we got was static. It's usually this way—just the night they broadcast Paul Whiteman's band or some other good program it's spoiled by howls and fading."

"Perhaps my set will do a little better," I suggested. I had a surprise in store for him!

He looked doubtful as I turned on the set switch. I had left my old aerial antenna attached on purpose and soon the room was filled with an ear-splitting excuse for music. Manipulation of the dials only served to make it worse. Occasionally it faded out altogether. Then the howls would start up again until my wife finally shouted, "Turn that thing off—it's terrible."

Satisfied, I laughed and disconnecting the old aerial and ground wires I then attached the lead-in wires of my new underground antenna, which I had installed just before dinner. "Now listen!" I commanded.

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"You see," I explained later to Bill. "I buried my new underground aerial about two feet below the ground, where wind and storms can't affect it so easily. They call this thing "Subwave-Aerial" and it's insulated some way to keep out interference and noise. It's combined with a scientific ground, so I'm sure now that I have the correct ground connection. All this isn't costing me any more than my old aerial antenna. And I'll never need to touch it again. It's guaranteed for 25 years.

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THE MICROSCOPIC RAIN IN "INTO THE GREEN PRISM." THE LORENTZ-FITZGERALD CONTRACTION

Editor, AMAZING STORIES:

A chance purchase of AMAZING STORIES has made me much interested in the magazine. Certainly when I saw its hair-raising title, I did not anticipate that it would give its readers much scientific knowledge. The reading of its pages proved my surmise to be incorrect, but made me think that it would be an advisable idea to change the name to "Scientifiction." I think it was the brilliant cover illustrations of Paul that first drew my attention to the magazine.

May I say that some of your authors occasionally make grave mistakes? There is one which I have particularly noted in your April issue, where Mr. A. Hyatt Verrill, writing of the microscopic men made visible with the Green Prism, states that each molecule would appear to this race as a "great cloud." He also states that the microscopic spray which bounces off the sand grains would fall upon them as a "gentle shower." Now, in our own world, the volume of a drop of rain water is nearly infinitesimally small in comparison with a great cloud in the heavens. It directly follows therefore, that if everything were proportionately smaller in the world of these dwarfed humans the drops of rain falling in their "streets" would be nearly infinitesimally small in comparison with the "great cloud" above them. When we consider that in this case the "great cloud" is but a molecule of water and that were it at all subdivided it would be decomposed into its hydrogen and oxygen atoms it is quite clear that rain could not fall upon the territory of these microscopic beings.

Relative to the Lorentz-Fitzgerald law of contraction, would it not be possible that a person, traveling in a machine through space at an extremely high speed would not notice any difference in his surroundings. Since, according to this law, objects in motion contract in the dimension coinciding with their path, I think it highly probable that this contraction would also apply proportionately to the fine network of nerves which makes up the retina of the eye. The altered focussing thus obtained of distorted objects, might make the observer's surroundings appear normal.

At present, I have no more to write, and conclude with best wishes for the future success of AMAZING STORIES or shall I say "Scientifiction."

Peter J. Martin,
44 Blessington Avenue, Dublin, Ireland.

(We hope and are quite sure that you will cease filling the role of chance purchaser, and that you will be one of our regular readers. AMAZING STORIES has made a great reputation under its title and with its distinctive cover pages, and it would be a delicate matter to change either feature. It is hardly fair to say, as you do, that a drop of rain water is infinitesimally small in comparison with the great cloud in the heavens. In many cases, where the cloud is big enough, your remark might apply. But it takes an astonishingly small quantity of water to make a cloud.

It seems to us that Mr. Verrill took no more than quite pardonable license in his treatment of the rain showers in the Manabi land.

We may have more to say in these columns on the Lorentz-Fitzgerald contraction. But it is hard to say what would happen if one were to travel so fast as to be subjected to an appreciable extent to this contraction.—EDITOR.)

A FAMILY STRIFE TO GET AMAZING STORIES

Editor, AMAZING STORIES:

We are enjoying the AMAZING STORIES magazine in our home, but I am very sorry to say that I have one complaint to make.

This home and fireside has always been a very peaceful place, but of late there have been daily stampedes and raids to gain possession of AMAZING STORIES magazine, and drastic action is being taken to preserve peace. There are no casualties to date.

We seem to derive a lot of scientific and historical facts from the book, and also we seem to remember these facts because their origin and usefulness are pictured to us in logical form.

Matured people are, I find, no different than little children. Connect certain facts by a story or apply them by a demonstration, associate them to common objects, and they remain with you forever.

You are a busy man so without further complaints, I will close wishing you health and success in your work.

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381 Fourth Avenue New York City

(Your tale about AMAZING STORIES in the home is quite graphic, and we strongly suspect that there are other homes like yours. The real solution to the trouble might be to buy several copies, but of course we couldn't ask for that. If you knew how we give our best efforts to the selection of stories and how carefully they are edited from the standpoint of history, literature and all branches of science, you would find an explanation for the next to the last paragraph of your very interesting letter. Such an appreciation as yours operates to inspire the editors, and we certainly thank you for your present communication.—EDITOR.)

AN ENGLISH READER TELLS OF CHANGES IN ENGLISH BUSINESS METHODS. THE "AVERAGE ENGLISHMAN" AND "JOHN CITIZEN."

Editor, AMAZING STORIES:

I wonder what you honestly think in your office of the average "Englishman." I know I am treading on Holy Ground but as one who has not yet had the opportunity to visit the land where abilities are more readily absorbed, I have often wondered if it is true that "John Citizen" is considered so green after all.

What I do like you all for over there, is your aggressive attitude, especially in the business sense. We are slow to commence a new venture or to air a new thought.

Although H. G. Wells just suits your world of readers, believe me, he had a h— of a time getting popular here. In fact, he always was regarded as either a vain idealist or a crank, but people generally are beginning to realize that what appeared cranky and crazy a few years ago are established habits and facts to-day.

We English will never admit it, but nevertheless we are becoming more Americanized every day. Our stores are mechanized and perfect in service and salesmanship. Business is beginning this last few years to develop into an exact scientific art.

And I'm sure we are glad of it, in spite of all the grumbles (which is our only privilege). Who would go back to the old order of travel, or huckster type of shop? The world is cleaner, much more comfortable and happier, I'm sure. If not, then it's the people's own thoughts in the wrong channel.

I have had every number of AMAZING STORIES, including the Annual, Winter and Spring issues, but I admit I only commenced reading six months ago. Still, it's sufficient to add that after reading the one number, I ordered all the back numbers. I now am always greedy for the next issue.

Why don't you publish one in England in addition or at any rate, advertise it in our newspapers? It's marvelous; the people I mention AMAZING STORIES to, think I'm joking and never heard of it.

If any of your readers would like any photo-postcards of London or any historical part of the old country, I will be delighted to send some in exchange for interesting cards of New York, and other parts of U. S. A.

By the way, the Channel Tunnel from England to France will be fact soon. They have already completed plans and are commencing shortly.

Every success for AMAZING STORIES. May it grow bigger—cannot be better surely.

H. Pedley,
138 Sutherland Terrace, Maida Vale,
London, England.

(You start your letter, which we find very interesting, by expressing wonder. So, in response to your wondering, we will say that we highly approve of the average Englishman, and we know one average Englishman or rather know of him, and we would be pleased to hear that he had visited our country—and that is yourself. The Democratic party of old times had for its slogan, the motto that the best governed country is the least governed. But that, unhappily, is no longer the case. Laws and statutes cannot suppress the crime that is so rampant here, where we are over-governed in the opinion of many.

England started the building of tunnels under water by the famous Thames Tunnel, going back to the middle of the last century. And now she has the Mersey Tunnel, crossing the river from Liverpool. In this city we have a number of tunnels. The Pennsylvania Tunnel starts underground in New Jersey about a mile back from the Hudson River, and then goes under the Hudson, under the city of New York and under the East River, coming out on Long Island. It is a tunnel whose length few people realize. Certainly it would be very interesting, to say the least, to be able to go from England to France without getting seasick. The tunnel in question is described and illustrated in SCIENCE AND INVENTION.—EDITOR.)

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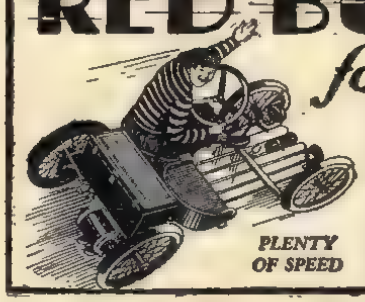

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A CRITICISM OF THE SIXTH GLACIER. THE FOURTH DIMENSION AND PSYCHICAL THINGS

Editor, AMAZING STORIES:

Being a reader of AMAZING STORIES as long as I'm on this side, I find it time to put my oar into the discussion.

First about the covers. Why do they have to be so lurid and screaming? Can't you tone them down a bit so one needn't be ashamed any more when acquaintances ask the eternal question: How, by all that's ——— can an intelligent chap like you read such lurid stuff? Really I get tired trying to convince my friends that AMAZING STORIES is not just cheap fiction as appearances are too much against it. The drawing as a rule is not so bad, but the color is awful. The stories as found in your magazine are on a high average. In every magazine one finds a story once in a while that's punk. Besides, tastes differ. The worst I've found in AMAZING STORIES in a long while is that "Sixth Glacier" by Marius. That fellow took too many liberties with physical laws. For instance: A glacier is formed through precipitation, so it can only grow according to the rain or snowfall. Then it travels in relation to its growth, which can never be more than a few yards a day. So express train speed is impossible. Furthermore: Such an ice cap would have to come out of the oceans and ice caps such as he describes would just about have dried up all the oceans. Which disposes of his shipping projects. Then, even if the people could have utilized all the remaining power resources to melt the ice, it would have taken them centuries to make an impression.

About interplanetary travel: Do you know that there is an old saga which says that long ago, when humanity was still young, a space ship came to earth in a blinding flash and a terrible roar. That it brought far advanced people who ruled and taught the young humanity. That they brought wheat, bananas and bees from their planet and that for several centuries there was quite a traffic between Venus and Earth. That, as soon as they had established a school and trained a staff of rulers and teachers, the bulk of them went back to Venus for good and that only four of them remained and became the real rulers of this earth.

Another thing. Why do you always knock the so-called psychical? Anybody that ever has had a real psychic or superphysical experience and is honest, can not deny that there is such a thing as a superphysical existence.

About the much discussed fourth dimension: One aspect of it may be time. Some curious actions that their perpetrators claim to do through the employment of the fourth dimension, are putting solids through solids or converting right-handed things into left-handed or vice versa, or turning things inside out, like a bowl, so that what was inside, later is outside.

It may be possible to do all such things by moving them back in time until they are brought back to the stage in which they existed only as an idea, turning them round there and bringing them back. This might become possible in such a short time that nobody could notice the actual happening. Some funny things do happen. I, for instance, had a man vanish in plain daylight in a fraction of a second on a street in the middle of a big town under conditions that made any escape, except through a two inch pipe, impossible. Besides I had plenty of disinterested witnesses. Without something like a fourth dimension, explanation of such happenings are impossible.

Frederick G. Hehr,
321 East 50th Street, New York City.

(Your letter is so descriptive that much of it requires no answer.

The editors find that stories criticized very unfavorably by some are greatly admired by others. The best we can do is to strike a good average and we hope we've succeeded.

It is impossible to say what the glaciers did in the glacial age. The few, comparatively speaking, now in existence travel very slowly. But who can tell what they did a hundred thousand years ago. What they might do in the future is unknown.

The legend about traffic between Venus and Earth, of which you tell us, is curiously like several of our interplanetary stories. We wonder who the four ruling Venerians on this earth were?

SCIENCE AND INVENTION, one of our magazines, gives a great deal of attention to psychic subjects, and we would recommend you to its columns for the treatment of these matters. We do not believe that your vanishing man went through a two-inch pipe. Even the fourth dimension could hardly explain it.—EDITOR.)

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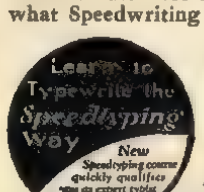

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THE PLANET JUPITER—IS IT INHABITED?

Editor, AMAZING STORIES:

I have bought copies of AMAZING STORIES regularly since the appearance of the first instalment of "Station X," some three years ago. That was the first time I read your magazine. And I may say that the cover design and the title attracted my attention. I am a veteran of the Spanish-American (Phillipine insurrection phase) war, peace time Regular Army service in the Coast Artillery, and the World War, with service overseas. Living a very active life from the time I first entered the army, and being one of the many humble actors in two momentous dramas, and seeing so many of our old time ideas and traditions shattered, I found food for much thought along lines that never occurred to me before. I found life rather dull at times, after leaving the army, and so, I was searching the newsstands for something interesting to read, and saw the copy of AMAZING STORIES. Trash, I thought, but I bought the copy, and well, I think the opening lines of this letter contains more praise than I could write if I tried ever so hard.

I find the discussion columns interesting, as well as the stories, and while I have not the ability to write learnedly, I am prompted to write to you after having read your editorial, "Life, The Amazing Puzzle," in the February issue. I am not questioning your sayings, nor commenting on the editorial. I am merely trying to sit at your feet and learn.

I find great interest in contemplating our sister planets, in my mind's eye, and any stories about them captures my attention. Some of the interplanetary stories I think good, while others are not so good, but that is beside the point I wish to write about.

Among other things in the editorial, you say Jupiter, by far the largest planet, is still in a plastic form. It has not cooled down. We know for a certainty that life, such as we encounter on this planet, can not exist on Jupiter." Are we sure that we know for a certainty that there is no life such as we know existing on Jupiter? Science answers yes, but I regret to have to accept that as a proven fact. It's too disappointing, and too sad. But do they know? The greatest telescope leaves Jupiter at a great distance from the unaided eye, and then the atmospheres both of the earth and Jupiter must be penetrated and the telescopes will magnify the moisture and dust in the two atmospheres the same as they magnify other objects, thereby giving a blurred, distorted image that may well be deceiving.

If there is a purpose in life, as some try to teach us there is, then there must be a Creator to give that purpose. If that is the case, and the Creator made this great, vast Solar System just in order to sustain life on this little sphere, to say nothing about the vastness of our universe alone, He must be rather a wasteful workman.

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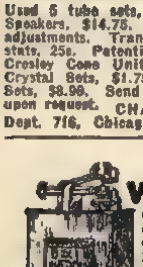

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life come into being wherever and whenever the conditions for life obtains, why could not those conditions have obtained on Jupiter, and the other outward planets ages ago? Is it their remoteness from the Sun? And why not life on the Sun? Do we know for a certainty that the Sun is actually hot? Could it not really be a cold body, and is it not possible that all the heat we get from the Sun is produced by the friction of the rays passing through our atmosphere, and their impact on the earth? And if that could be true, would not the rays produce the same effect on the distant planets? Then, the mass of Jupiter being greater than the earth, does it necessarily follow that the gravity pull per square unit would be correspondingly greater than on earth? The foregoing does not represent my opinion on the subjects mentioned, but merely thoughts that sometimes course through my mind.

Henry S. Hatton,
Greentown, Ind.

(There is a strong probability that the planet, Jupiter, is not habitable. How such things can be investigated or determined positively, exceeds the powers of humanity. We do not see however, that you should be disappointed, because we have settled that there is no life on Jupiter. It sometimes seems as if there were too much life on this earth. Jupiter seems to be in a state of fusion, and undoubtedly the sun is hot. The heat from the sun is not produced from friction of the rays as they pass through the atmosphere nor by their impact on the surface of the earth. The gravity force of Jupiter is of course much greater than that of the earth.—EDITOR.)

THE NON-EXPLOSIVE NATURE OF TRINITROTOLUENE. A GOOD CRITICISM OF "THE LAST MAN"

Editor, AMAZING STORIES:

May I call your attention to an error in the story entitled, "The Last Man" in your February issue? In the story, the man finds a can of T N T in the museum with a warning label stating that a slight concussion will explode it and proceeds to blow up the birth factory by dropping it from the balcony.

Now as a matter of fact a slight concussion, or a heavy one, or either, will not explode T N T. During the war, high explosive shells containing T N T were exploded by a percussion cap of the fulminate of mercury which in turn ignited the T N T. I worked for a time in a shell loading plant where T N T was melted in vats by steam and then poured into hollow steel shells. These vats had metal covers upon which crystalline deposits of T N T formed in a yellow coating resembling maple sugar, but somewhat lighter in color. I have often seen workmen remove this deposit by pounding the covers with wooden mallets and never was there any danger of exploding the T N T. So it is apparent that no slight concussion will ignite it.

Otherwise the story was splendid and could be made perfect by the mere substitution of another explosive—fulminate, for example. I think, however, that you should call attention to the error for the benefit of your readers, as a magazine of your type should be accurate as to details of this sort.

In conclusion, may I thank you for many happy hours spent in reading your interesting publication?

T. A. Gonzales,
201 East 87th Street, New York City.

(We thank you for your correction about explosive nature of T N T, but you must remember that many of these chemical explosives undergo a slight decomposition, and then become quite dangerous. It would be finely divided T N T which would seem most liable to such decomposition. The melted material would certainly be more stable. Organic nitro compounds when partly decomposed may become very sensitive to concussion.—EDITOR.)

AMAZING STORIES AN INCITEMENT TO THINKING. AND IT LIGHTENS HOUSEWORK

Editor, AMAZING STORIES:

I have just finished the May number of your magazine. I wish there were twice as many tales in it.

"The Diabolical Drug" by Clare W. Harris is extremely interesting. Let's have more of hers, even though we do shudder!

"The Invisible Finite" certainly holds one enthralled, but please tell Robert A. Wait to end his stories more kindly in the future. It left me aching to read that the poor professor was lost to humankind. It seems horrible to think of him seeking and searching forever and knowing that he is helpless. It would have been much better

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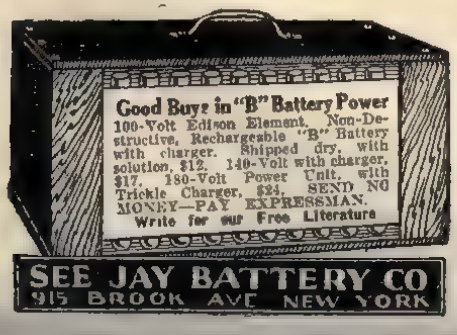
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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUG. 24, 1912

Of AMAZING STORIES, published monthly at New York, N. Y., for April 1, 1929.

State of New York,
County of New York. ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Gustav Gardner, who, having been duly sworn according to law, deposes and says that he is an Assistant Vice-President of Irving Trust Company, owner, as Trustee in Bankruptcy, of the AMAZING STORIES, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations.

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Irving Trust Company, as Trustee in Bankruptcy of Experimenter Publishing Company, Inc., 233 Broadway, N. Y. City; Editor, Arthur J. Lynch, 230 Fifth Ave., N. Y. City; Managing Editor, none; Business Manager, B. A. Mackinnon, 230 Fifth Ave., N. Y. City.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) The owner is Irving Trust Company, of 233 Broadway, New York City, as Trustee in Bankruptcy of said Experimenter Publishing Company, Inc., said Irving Trust Company having been duly appointed Receiver in Bankruptcy on February 20, 1929, and Trustee on March 28, 1929.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

IRVING TRUST COMPANY,
By G. Gardner,
Assistant Vice-President.

Sworn to and subscribed before me this 2nd day of April, 1929.

Hiram S. Gans,
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